gust 1945

Chemical Industries

IN THIS ISSUE

War and Chemical Commerce 249

Penetron 253

Industry Surveyed on Veteran Problems . . 254

War Affects the Coatings Industry . . 257

Synthetic Rubber 260

HOW TO ORGANIZE A SALES CONTROL SYSTEM 265

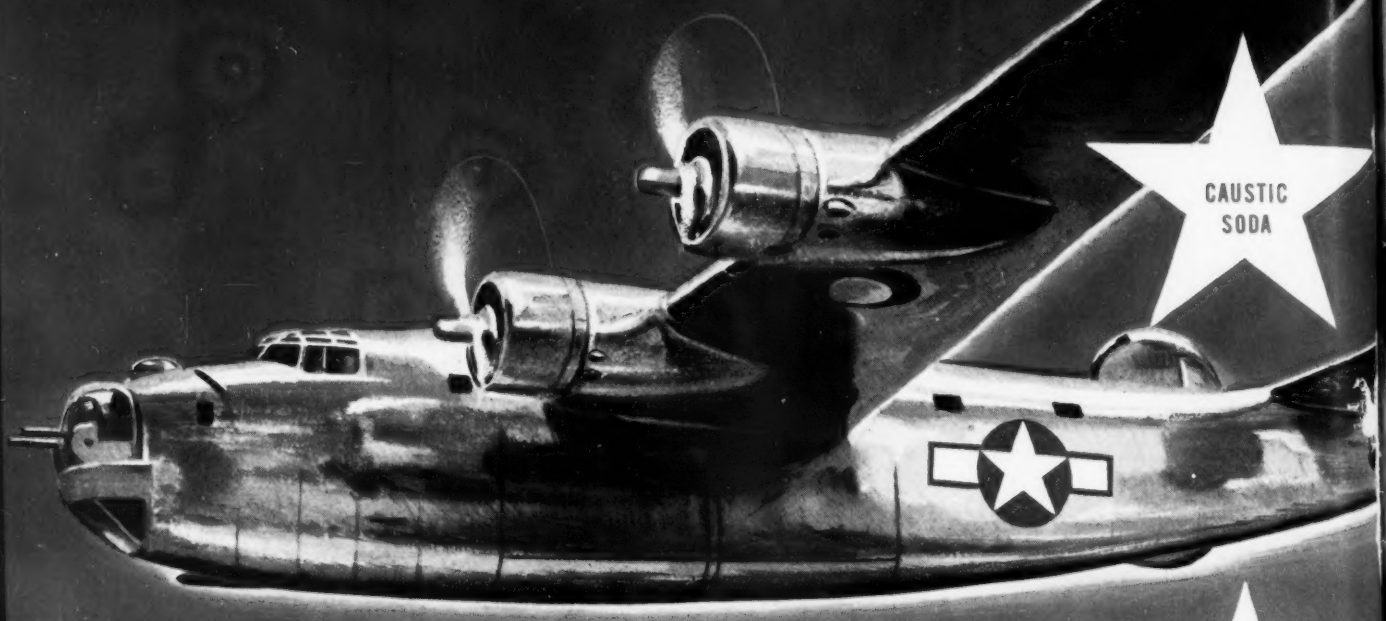
TECHNOLOGY DEPT

LIBRARY
AUG 14 19
DETROIT

CHEMICALS ON THE MOVE

War Also Catalyzes Chemical Commerce p. 249

Gasoline Needs Alkalies



CAUSTIC POTASH

CAUSTIC SODA

SODA ASH

SODIUM NITRITE

CALCIUM CHLORIDE

CHLORINE

Gasoline is the life blood of motive power... it actuates speed of flight, provides the driving force that runs engines and turns countless wheels and tracks, it generates heat. Important to gasoline are Solvay Alkalies and related products—proving that in war as in peace alkalies are indispensable!

SOLVAY SALES CORPORATION *Alkalies and Chemical Products Manufactured by The Solvay Process Company*

Westvaco CHEMICALS

FOR THE TEXTILE INDUSTRY

PUBLIC LIBRARY
AUG 14 1945
DETROIT

CAUSTIC SODA — Liquid • Solid • Flake

CAUSTIC POTASH — Liquid

MONOSODIUM PHOSPHATE

DISODIUM PHOSPHATE

TRISODIUM PHOSPHATE

TETRASODIUM PYROPHOSPHATE

SODIUM TRIPOLYPHOSPHATE

EPSOM SALTS

SODIUM SULPHIDE

HYDROGEN PEROXIDE (25 Volume)*†

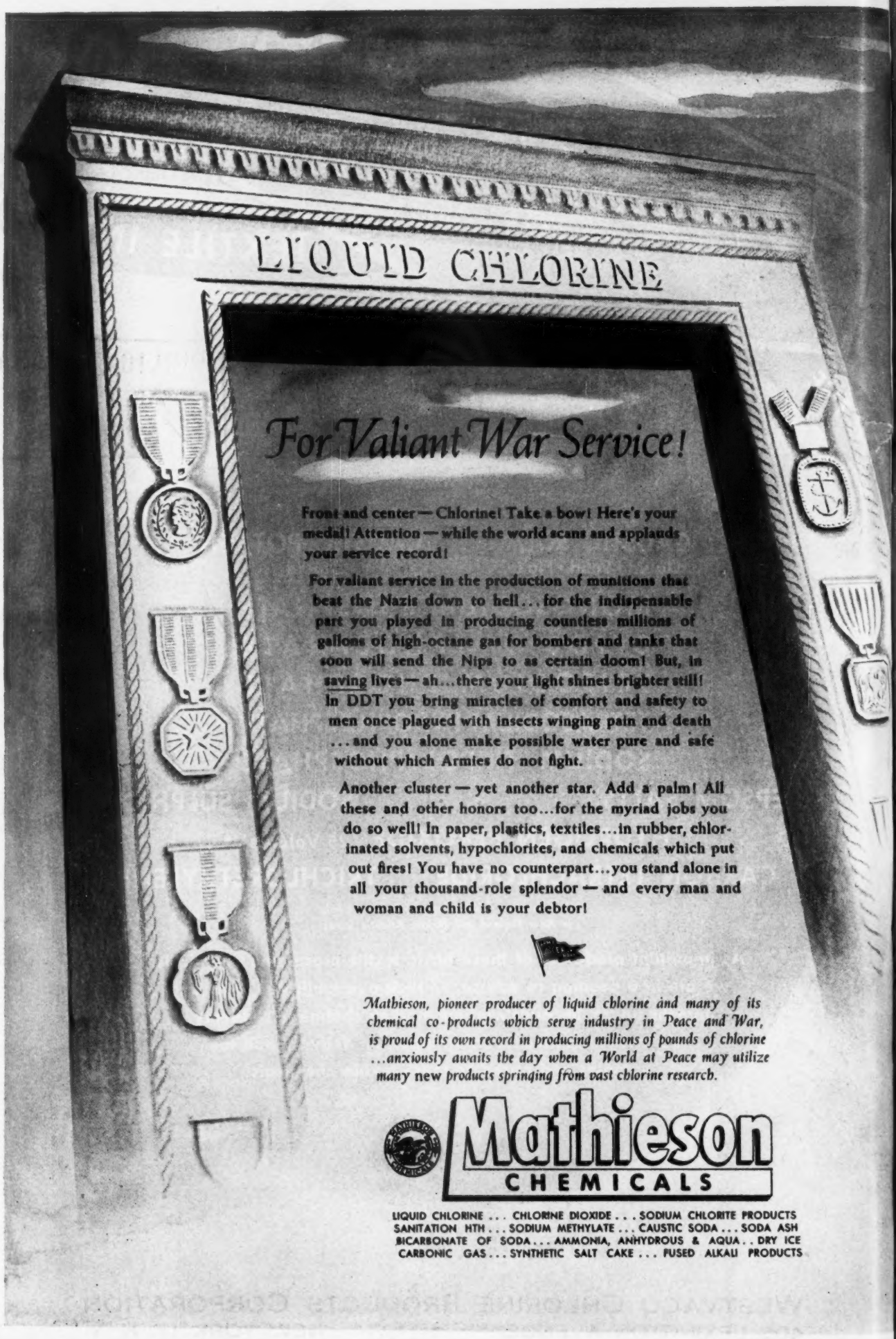
CARBON TETRACHLORIDE*

TRICHLORETHYLENE

*On Allocation. †For delivery by tank truck only in New England and Middle Atlantic States.

As important producers of these basic textile-processing chemicals, we are in a position to advise on their availability . . . now and into the future. Because wartime markets change so suddenly, we invite inquiries for information on delivery and for samples and prices on these textile chemicals.

WESTVACO CHLORINE PRODUCTS CORPORATION
405 LEXINGTON AVENUE, NEW YORK 17, N. Y.
CHICAGO, ILL. GREENVILLE, S. C. NEWARK, CALIF



For Valiant War Service!

Front and center — Chlorine! Take a bow! Here's your medal! Attention — while the world scans and applauds your service record!

For valiant service in the production of munitions that beat the Nazis down to hell... for the indispensable part you played in producing countless millions of gallons of high-octane gas for bombers and tanks that soon will send the Nips to as certain doom! But, in saving lives — ah... there your light shines brighter still! In DDT you bring miracles of comfort and safety to men once plagued with insects winging pain and death ... and you alone make possible water pure and safe without which Armies do not fight.

Another cluster — yet another star. Add a palm! All these and other honors too... for the myriad jobs you do so well! In paper, plastics, textiles... in rubber, chlorinated solvents, hypochlorites, and chemicals which put out fires! You have no counterpart... you stand alone in all your thousand-role splendor — and every man and woman and child is your debtor!

Mathieson, pioneer producer of liquid chlorine and many of its chemical co-products which serve industry in Peace and War, is proud of its own record in producing millions of pounds of chlorine ...anxiously awaits the day when a World at Peace may utilize many new products springing from vast chlorine research.

Mathieson
CHEMICALS

LIQUID CHLORINE ... CHLORINE DIOXIDE ... SODIUM CHLORITE PRODUCTS
SANITATION HTH ... SODIUM METHYLATE ... CAUSTIC SODA ... SODA ASH
BICARBONATE OF SODA ... AMMONIA, ANHYDROUS & AQUA ... DRY ICE
CARBONIC GAS ... SYNTHETIC SALT CAKE ... FUSED ALKALI PRODUCTS

THE CHEMICAL BUSINESS MAGAZINE

Chemical Industries

VOLUME 57
NUMBER 2

August 1945 Contents

EDITORIALS 245

WAR ALSO CATALYZES CHEMICAL COMMERCE . . . . . by Williams Haynes 249

PENETRON——NON-PIERCING LIQUID LEVEL AND WALL THICKNESS GAUGE 253

THE CHEMICAL INDUSTRY PREPARES FOR THE VETERAN . . . . . Editorial Staff Report 254

WAR DEVELOPMENTS IN THE COATINGS INDUSTRY . . . . . by Laszlo Auer 257

SYNTHETIC RUBBER; FROM 3,600 TO 1,000,000 TONS PER YEAR IN FOUR YEARS 260

HOW TO ORGANIZE A SALES CONTROL SYSTEM . . . . . by R. L. Cain 265

PUBLICATION STAFF

Editor
ROBERT L. TAYLOR

Chemical Editor
HOWARD C. E. JOHNSON

Engineering Editor
HERMAN W. ZABEL

Assistant Editor
MARTHA NEWTON

Contributing Editors
T. P. CALLAHAN
W. A. JORDAN
T. N. SANDIFER

Production Manager
E. MARY TROW

CONSULTING EDITORS
ROBERT T. BALDWIN
L. W. BASS
BENJAMIN T. BROOKS
J. V. N. DORR
CHARLES R. DOWNS
ROBERT J. MOORE
ERNEST W. REID
NORMAN A. SHEPARD

BUSINESS STAFF

Advertising Manager
L. CHARLES TODARO

New York
STEPHEN GARDNER

Chicago
FRANK C. MAHNKE, JR.

Los Angeles
DON HARWAY

Circulation Manager
FLORENCE SANDERS

DEPARTMENTS

ABOUT THE AUTHORS 188
BETWEEN THE LINES 278
NEW PRODUCTS AND PROCESSES 282
NEW EQUIPMENT 290
PACKAGING AND SHIPPING 300
PLANT OPERATIONS NOTEBOOK 306
LABORATORY NOTEBOOK 308
INDUSTRY'S BOOKSHELF 310
BOOKLETS AND CATALOGS 312
GOVERNMENT REGULATIONS 334
CANADIAN NEWS 336
CHEMICAL ECONOMICS AND STATISTICS 341
WE 360
PATENTS AND TRADEMARKS 361

NEWS OF THE MONTH

WASHINGTON 191
CHEMICAL NEWS IN PICTURES 273
GENERAL NEWS 317
CHEMICAL SPECIALTIES NEWS 326
MARKET OUTLOOK 346
CURRENT PRICES 348

INDEX TO ADVERTISERS 358

COVER PHOTO courtesy of Hercules Powder Co.

Published monthly, except twice in November, at 1309 Noble St., Philadelphia 23, Pa., and entered as 2nd class matter July 15, 1944, at the Post Office at Philadelphia 4, Pa., under the Act of March 3, 1879. Subscription $4 a year, $6 for two years. Add $2 per year for postage to foreign countries other than Canada and Latin America. Single copies 50c. Canadian subscriptions and remittances may be sent in Canadian funds to Chemical Industries, P. O. Box 100, Terminal A, Toronto, Canada. Copyrighted, 1945, by MACLEAN-HUNTER Publishing Corporation, 522 Fifth Avenue, New York 18, N. Y., Murray Hill 2-7888; Horace T. Hunter, President; John R. Thompson, Vice-President and Treasurer; J. L. Frazier, Secretary. Office of Publication: 1309 Noble Street, Philadelphia 23, Pa. ● EDITORIAL AND EXECUTIVE OFFICES: 522 FIFTH AVENUE, NEW YORK 19, N. Y., Murray Hill 2-7888. DISTRICT OFFICES: Chicago: 309 West Jackson Boulevard, Chicago 6, Ill., Harrison 7890. Los Angeles: 816 West Fifth Street, Los Angeles 13, Calif., Mutual 3512. London: 57 Goldsmith Avenue, Acton, London W3.

SEE US ABOUT PLASTICIZERS FOR

VINYL COPOLYMERS
POLYVINYL CHLORIDE
POLYVINYL BUTYRAL
NITRO-CELLULOSE
CELLULOSE ACETOBUTYRATE
ACRYLIC RESINS and
SYNTHETIC RUBBERS

HARCHEM
PLASTICIZERS
Alkyl Roleates
Dibutyl Sebacate
Capryl Alcohol

HARDESTY CHEMICAL CO., INC.
41 East Forty-second St., New York 17, N.Y.

ABOUT THE AUTHORS

WILLIAM S. HAYNES, who writes in this issue on war's effect upon chemical business, is alleged to have retired after he sold CHEMICAL INDUSTRIES. But, judging from this article, we know that this just ain't so. It is one of the sixty odd chapters, all fully documented and richly annotated, in the two stout volumes of his monumental, projected five-volume history, "American Chemical Industry" which will be published this fall.

Bill writes that he is "busy writing chemical history, mowing the lawns, and killing weeds in the gardens."

Bill rouses his old friends' envy by living "on a little place down in Connecticut" where his table is supplied from a generous, walk-in deep freeze, stocked with his own beef and pork, and in an historic house, built in 1750 by one of his Indian-fighting ancestors, Col. Isaac Williams. This accounts for at least one of his many hobbies, early Connecticut history. He is Curator of the Stonington Historical Museum and has recently been elected a Fellow of the Institute of American Genealogy.

LASZLO AUER, author of "War Developments in the Coatings Industry," page 257, was born in 1901, Budapest, Hungary. Receiving his education at the German Institute of Technology, Bruenn, Czechoslovakia, he earned the degrees of Ch.E. in 1923 and D.Sc. in 1926.

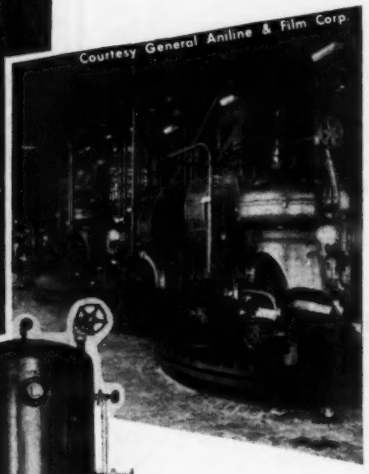
Dr. Auer first came to the United States in 1929 to visit several American companies which were interested in obtaining rights to his numerous patents. He moved over here permanently in 1936.

As holder of over 300 foreign patents and over 55 U. S. patents with many more pending, Dr. Auer is now doing consulting work. He has been connected with the coatings field since 1923.

Dr. Auer's most important hobbies give him a year-round schedule of outdoor exercise. For in the affable seasons he enjoys tennis and rowing, while the snowy days find him skiing in New England.

"MIKE" CAIN was introduced to our readers last month. In this issue, page 265, a sequel to his previous article on Sales Control appears, and we think that he has done an unusually outstanding job. Evidently, we're not the only ones, for here is what one of the pre-publication reviewers has to say about it: "Frankly, I have read many articles on this subject, but I do not recall one that was 'to the point' and as clearly stated as this one. I really do think this manuscript is a masterpiece and I think it will have an extremely practical value to many of your readers. There is nothing abstract in the way in which he has presented his material. In fact, I felt that it was so down-to-earth that a reasonably intelligent sales control manager could pattern his own system after Mike's system without a great deal of difficulty."

HAERING GLUCOSATES
and Haering PROPORTIONING UNITS
assure correction and control of CORROSION, SCALE, ALGAE in Industrial Plants



WRITE FOR "H-O-H WATER STUDIES"

WE READ WATER

D. W. HAERING & CO., Inc.
GENERAL OFFICES:
205 West Wacker Drive, Chicago 6, Ill.

WELLMAN
Williams
BUCKETS
Are Lighter, Stronger
Give Longer Service

Now all Wellman Buckets are welded rolled steel construction. Clamshell, Dragline, and Custom-Built types — 3/8 to 16½ yd. capacities.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING COMPANY
7027 Central Avenue • Cleveland 4, Ohio
Sales and Service Agencies in Principal Cities

Boots and Spurs..

Imagine equipping an army of 10 million men if leather and leather equipment were made by 1845 methods! In those days, months were required to convert hide into leather and years would have been required to make the leather for our present army. Today, thanks to bichromates, hides are converted into leather in a few days.

Chrome tanned leathers are tough. They can take the rocks of Italy and the wear of steaming New Guinea jungles.

A recent investigation of army boots in tropical areas revealed that chrome tanned leather showed little deterioration, while leathers produced by other processes deteriorated and became moldy.

Large quantities of Mutual's bichromates and Koreon are required for the leather industry. And vast amounts of Mutual's chromium chemicals are employed in a wide number of additional industries . . . aircraft, shipbuilding, tool manufacture, textile, etc.

The same know-how that has made Mutual's chromium chemicals indispensable to many manufacturers of both war and peace-time products may fit into your process. A Mutual representative will be glad to discuss chromium chemicals with you.

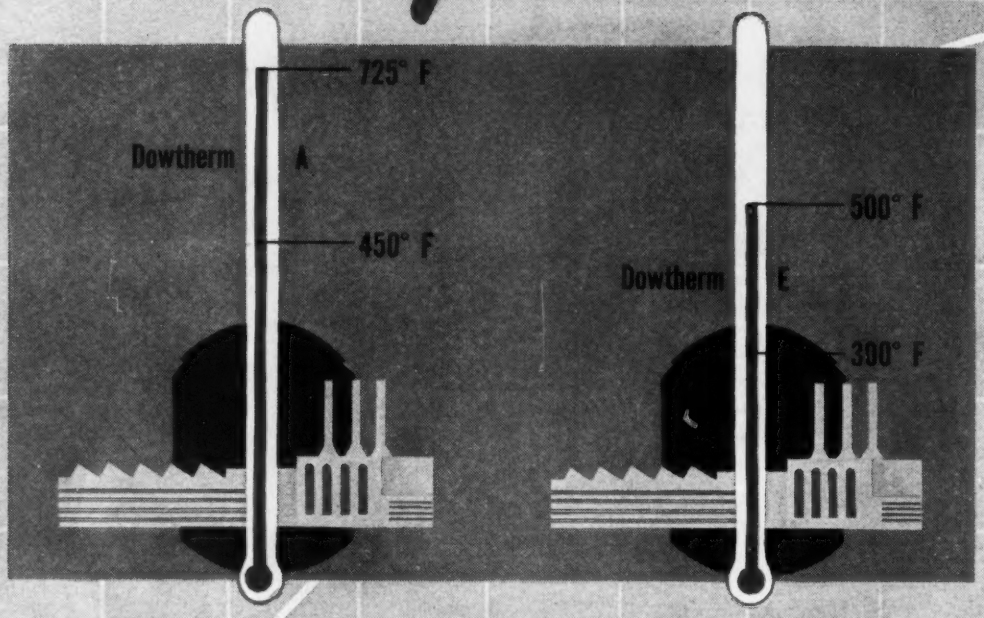
BICHROMATE OF POTASH • CHROMIC ACID • BICHROMATE OF SODA

MUTUAL CHEMICAL COMPANY OF AMERICA

270 MADISON AVENUE, NEW YORK 16, N.Y.

1845-1945 . . . One Hundred Years of Chromium Chemical Progress

Announcing Dowtherm E



New Member of the Dowtherm Family!

Dowtherm A has a new teammate! It's Dowtherm E . . . and it's ready to extend the benefits of Dowtherm vapor heating to another important temperature bracket . . . the range between 300° and 500° F.

Dowtherm E is good news to the food, plastic, laundry, and other industries that operate with these lower processing temperatures. It makes available to them, *within their particular temperature range*, the specific advantages inherent in Dowtherm vapor heating . . . precise control, uniformity of product, economical upkeep, simplicity of operation under low operating pressure.

At higher temperatures up to 725° F., Dowtherm A has been solving difficult heating problems for many years. Now Dowtherm E brings the same accurate control . . . the same efficient, low-pressure heat transfer . . . within reach of still other industries.

Dow will be glad to give you the details about this newest Dowtherm. Just drop a line to Midland, or contact your nearest Dow office.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle

Dowtherm

The high-temperature low-pressure heat transfer medium

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

WASHINGTON

T. N. SANDIFER *reporting*

German Technical Publications . . . Tanning Extracts . . . Natural Gas Hearings Synthetic Fuel Funds . . . Phosphate Rock Cartel

War Production Board Reports on Chemical Achievements in War

ACCOMPLISHMENTS OF THE CHEMICAL INDUSTRY, some of them phenomenal, account for a large segment of War Production Board's report for 1944, which has now been issued.

Among the nation's outstanding wartime industrial developments, Chairman Krug listed penicillin, atabrine and DDT. Other products of the chemical industry which have been vital in the war are vinyl resins, used in water desalination bags for lifeboats, powder bags, rifle coverings to check corrosion in the tropics; cellulose plastics, particularly ethyl cellulose as a hot melt dip for engines and parts as protection against corrosion; phenolic resins, for which a new use as bonding agent in laminated rocket tubes was developed in 1943; and the older chemicals such as ethyl alcohol and carbon black in synthetic rubber manufacture, and toluene and benzene in aviation gasoline and explosives.

The diversity of these uses points up another observation made in the report:

"Because of the virtual impossibility of determining end use of most chemicals, chemical controls imposed during the war have been for the most part "M" orders restricting the use of raw materials; few "L" orders, limiting end products, have been issued for chemicals."

The greatest chemical problem of 1944 resulted from the sharp increases in military requirements in the Fall of 1944, the report states, such as increased tire program, increased synthetic rubber program, augmented demands for carbon black, and corresponding demands for corollary materials. The report cites the interesting point that carbon black is entirely American—it has no substitute, and the sole source of supply is the United States.

Increased military requirements for naphthalene, its derivatives, phthalic anhydride and the resultant plasticizers—dibutyl phthalate, used for smokeless powder, dimethyl phthalate, used primarily as an insect repellant, dioctyl phthalate, used as a plasticizer in cable and wire insulation—in 1944 led to screening of end-use requirements and later an expansion program for more phthalic anhydride and for increased naphthalene production.

The production of penicillin and DDT, Chairman Krug characterizes as "perhaps the most amazing production stories of the war."

Chemicals Furnished Europe

INCLUDED IN A TOTAL OF $89,000,000 of industrial rehabilitation materials supplied to European countries under UNRRA have been substantial quantities of industrial chemicals.

Extension of Price Options to Tanning Extract Importers

CERTAIN IMPORTERS OF QUEBRACHO EXTRACT having called attention to the impossibility of completing all contracts within the time limit in which to claim the maximum price in effect prior to January 1, 1945, are now being given to September 30, 1945, War Production Board, which authorized the importers to divert certain of their quebracho imports to low-inventory customers instead of making deliveries to contracting buyers, back their application for an extension of time in which to make deliveries under the maximum price in effect earlier in the year.

Federal Power Commission Sets Hearings Dates for Natural Gas

PUBLIC HEARINGS HAVE BEEN SCHEDULED by Federal Power Commission in the principal gas-producing and consuming areas beginning with a hearing at Kansas City, September 18.

This apparently indicates abandonment of a behind-scenes plan to move the FPC hearings up, in the face of a Senate inquiry already launched under Senator O'Mahoney, in which the trend of testimony has been unfavorable toward the Commission. Suggestions have been made to the committee that FPC's power over natural gas production locally, and over gas conservation policy, be checked legislatively.

In addition to the hearing September 18, others are scheduled for October 9, at Oklahoma City, and Octo-

ber 30, at New Orleans. Dates are to be announced later for hearings to be held in Texas and other producing areas, and in certain gas-consuming centers.

Among other things, the Commission indicates that a comprehensive study is to be made of the utilization of natural gas, particularly in manufacture of carbon black. This forecast is bolstered by the following subheadings for Commission investigation: policies regarding the use of natural gas; the question of control of end uses; economic relations of natural gas with competing fuels and raw materials; questions of legal restrictions on "exports and imports" of natural gas in interstate commerce.

Another important subject, it is stated, will be "the potentialities of synthetic production" covering the entire fuel and raw material complex, costs, processes, recent foreign developments, extent of development of synthetic processes by U. S. companies, government agencies and foreign interests, and the national defense aspect of this matter.

Still others include an inquiry into the extent and control of physical waste, state laws governing production, waste and conservation, long-range pipeline transmission of natural gas, reserves, and probable life of these reserves and supplies.

Koppers Divests Certain Utility Holdings

WITH THE BLESSING OF THE Securities and Exchange Commission, and on its orders under the SEC Holding Company Act, Koppers Company, Inc., has elected to retain its extensive chemical and other industrial businesses, and shed certain utility holdings.

The record of the case before SEC indicated that Koppers is engaged primarily and directly in production, manufacture and sale of crude and refined coal-tar products, treated and untreated forest products, coke and gas products, design and construction of by-product coke plants and ovens, chemical plants and related auxiliary equipment and structures. Among its other activities the Company operates for Rubber Reserve a butadiene and styrene plant.

In addition to its direct operations, Koppers controls several subsidiaries including a utility holding company, which it has now agreed to dispose of, in favor of retaining its other, and more direct operations, releasing Koppers from its status as a holding company under the meaning of the SEC Act.

German Technical Publications

IT SEEMS IMPROBABLE, from available information, that any German technical publications are now being produced. None have been since V-E Day, it is stated by those who have followed these matters here.

There is under consideration an effort by U. S. authorities to bring out such copies of specified issues as will complete files of various agencies in this country, but no details have been announced on this idea. Those publications received during the war were turned over to the Alien Property Custodian who caused such copies to be published for the purpose as seemed necessary at the time. These were sold to libraries and research organizations, and furnished to the National Research Council.

Mineral and Metal Subsidies Continued for Year

SUBSIDY PAYMENTS ON PRODUCTION of strategic metals and minerals, and certain other related products, are continued for another year under terms of S. 502, which the President has signed, and which has now become Public Law 88. Among the provisions, is one that requires all classes of premiums on copper, lead and zinc to be noncancelable except to make individual adjustments of income to specific mines.

So-called Regional Authorities Under Fire

A GROUP OF 31 REGIONAL LAND AND WATER organizations, through a representative committee, is circulating its objections to regional authority legislation, such as Missouri Valley Authority, and similar developments, patterned on TVA. Opposition is directed specifically to the Rankin Bill, H.R. 1824, which would establish nine Authorities, one for each of the major river basins of the country.

The objections of the group were presented to a Senate subcommittee during hearings on the MVA, but the members now feel that their views should be more widely known.

Permanent War Research Approved by House

THE HOUSE HAS PASSED AND SENT to the Senate the bill, H.R. 3440, providing for a permanent postwar military and naval research program in technical and scientific fields. The bill authorizes an annual appropriation of $8,000,000 directly to the National Academy of Sciences.

Hard Rock Phosphate Association Told to Break Away from Cartels

THE FEDERAL TRADE COMMISSION has recommended to the Florida Hard Rock Phosphate Export Association that it withdraw from or rescind certain cartel agreements with foreign producers of North African and Curacao phosphates which were found by the Commission to have a tendency to restrain trade within the United States. The fact that this and other associations in this field were under attack by FTC has been reported here previously.

The Commission has now concluded an investigation of the association, under provisions of the Webb-Pomerene Act (Export Trade Law) and its recommendation to dissolve the stipulated foreign agreements has resulted.

The Commission has been investigating the practices of Phosphate Export Association, another group, it is stated, and now has that matter under consideration, but has made no definite announcement in the case.

(Turn to page 194)

ADVENTURES IN THE "MARGIN OF EXPERIENCE"

Paper Making—

A BUSINESS THAT BUILDS BUSINESS

Old in years but young in spirit, the paper industry is an outstanding example of what practical and courageous pioneering can do to build business not only for itself but for other industries as well.

New and improved papers are revolutionizing the packaging of hundreds of products ...improving printing processes...making possible more durable wrappings, tags, maps, blueprints, wall coverings. Everywhere paper is being used in new ways.

Serving the paper industry for more than three decades, Niagara has helped to provide that "Margin of Experience" in which such progress is made.

A pioneering organization itself, Niagara has that "Margin of Experience" that means improved service in electro-chemical products.

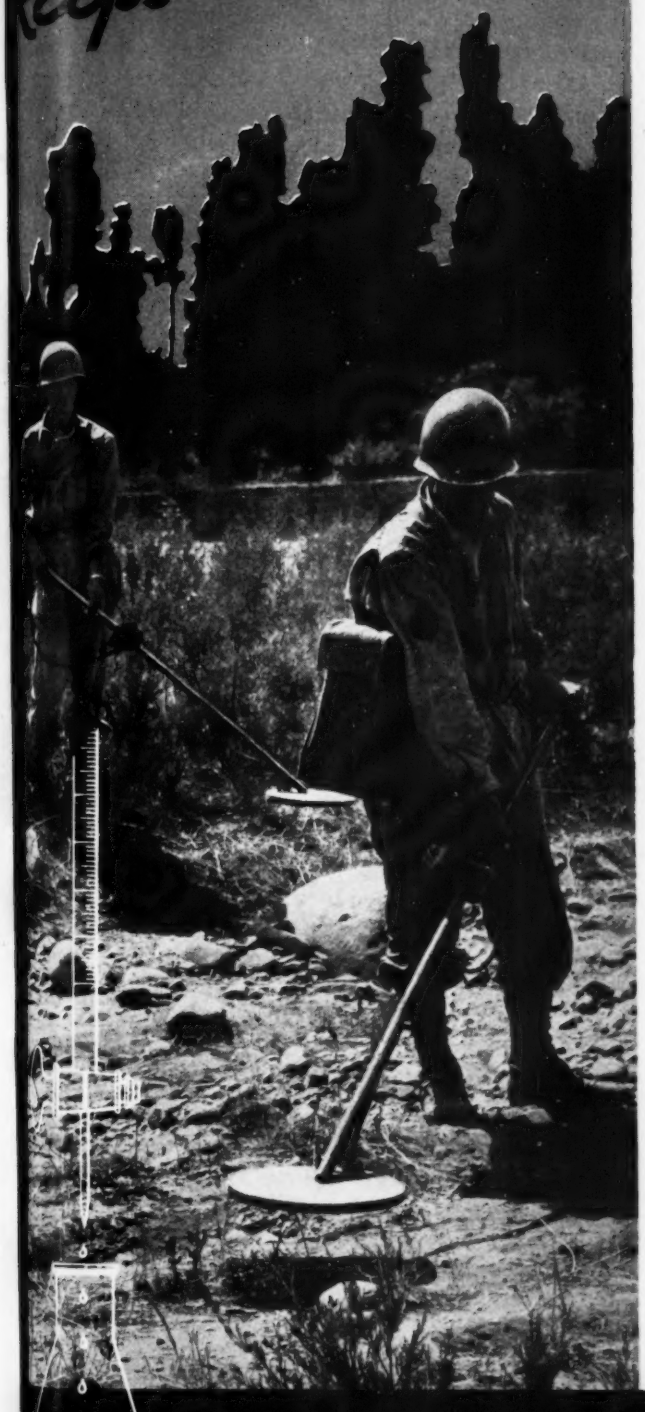
Niagara ALKALI COMPANY

60 EAST 42ND STREET, NEW YORK 17, N. Y.

Caustic Potash • Caustic Soda • Paradichlorobenzene
Carbonate of Potash • Liquid Chlorine • Niathal

New, tiny, miracle battery keeps mine detectors on the alert!

Chemical exactness enables this new-type battery (shown above in actual size) to stand up in torrid heat and jungle rains.



A tiny but incredibly powerful and long-lasting battery is now powering walkie-talkies and mine detectors in the Pacific war theatre, and helping to save lives.

Specially built to withstand tropical heat, jungle rains and corrosive fungi, these mercury batteries—whose cells are five-eighths of an inch high—will run about five times as long and "give five times as much service" as the best battery of the traditional type. Experts foresee a wide civilian market for the mercury battery—in hearing aids, fire alarms, portable radio sets, and in the marine and railroad fields.

One of the factors essential to the success of this new-type battery is the use of chemicals of exacting purity. The J. T. Baker Chemical Co. is supplying chemicals for this battery.

Chemical exactness is an art long associated with the name of J. T. Baker Chemical Co. A pioneer in reagent laboratory chemicals with the *actual analysis on the label,* Baker has been trained to produce purity to the decimal, for Fine and Industrial Chemicals to the Government's exacting specifications.

If you have special chemical requirements for war production or in anticipation of post-war needs—if you require chemical measured purity to predetermined standards, we invite you to discuss your problems in confidence with Baker.

We may be able to help you, for Baker Chemicals are kept abreast of industry's exacting needs.

J. T. Baker Chemical Co., *Executive Offices and Plant:* Phillipsburg, N. J. *Branch Offices:* New York, Philadelphia and Chicago.

Baker's Chemicals

C. P. ANALYZED • FINE • INDUSTRIAL

Baker's

AHCO PRODUCTS

METHYL CELLOSOLVE STEARATE

METHYL CELLOSOLVE STEARATE is a synthetic ester and is used as a plasticizer for cellulose derivatives and for resins. The following data may suggest other uses.

Chemical formula	$C_{17}H_{35}COOCH_2CH_2OCH_3$
Molecular weight	342
Color (platinum cobalt scale)	175
Melting point	64° to 70°F
Flash point	378°F
Acidity, less than 1.0 mg. KOH per gram ester	

★

BUTYL STEARATE

BUTYL STEARATE is a synthetic ester and is used as a plasticizer in cellulose and polyvinyl derivatives, also for cosmetics and for paper coating. The following data may suggest other uses.

Chemical formula	$C_{17}H_{35}COOC_4H_9$
Molecular weight	341
Color (platinum cobalt scale)	130
Melting point	64° to 70°F
Flash point	358°F
Acidity, less than 1.0 mg. KOH per gram ester	
Saponification number,	171-179 mg. KOH per gram ester

ARNOLD - HOFFMAN & CO., INC.
Manufacturing Chemists
PROVIDENCE, R. I.
Established in 1815
Plants at Dighton, Mass. and Charlotte, N. C.
NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE

With respect to the Florida group, the FTC specifically recommended cancellation of the so-called Paris and Brussels agreements and certain other arrangements involving exports and quotas of Florida phosphate. The Association also will be required to file certain data periodically with the FTC and to state shortly if it accepts the recommendation.

Compromise on Synthetic Fuel Research Funds

HOUSE AND SENATE CONFEREES COMPROMISED on appropriations in the Interior Department bill, as it was finally approved, to give Bureau of Mines $7,000,000 for demonstration plants in connection with development of synthetic liquid fuels. The House had allowed $6,000,000, and the Senate version, $10,000,000, for this purpose. A compromise also was reached on $579,000 for oil and gas investigations in place of $583,000 proposed by the Senate, and on $650,000 for production of alumina from low-grade bauxite, aluminum clays and alunite. The House had proposed $600,000, and the Senate, $675,000.

RFC Consolidates

CONSOLIDATION OF CERTAIN SUBSIDIARIES into the Reconstruction Finance Corporation itself is under way. The merger, as called for under a law just signed by the President, will involve Rubber Reserve Company, Metals Reserve, Defense Plant Corporation, Defense Supplies Corporation, and others. These subsidiaries will now become a part of the structure of the RFC in a simplification move which it is claimed will result in some economies of operation.

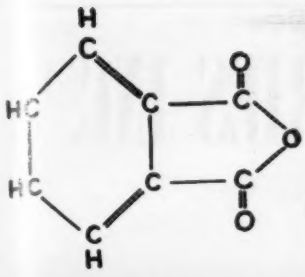
Trade Practices For Refrigerants Industry

THE FEDERAL TRADE COMMISSION HAS PROMULGATED trade practice rules for the low-pressure refrigerants industry that are designed to maintain free and fair competition and prevent disruptive trade practices. The rules were requested by the industry. This industry manufactures sulphur dioxide, methyl chloride, various freons and other actual or potential refrigerants.

Synthetic Rubber Program

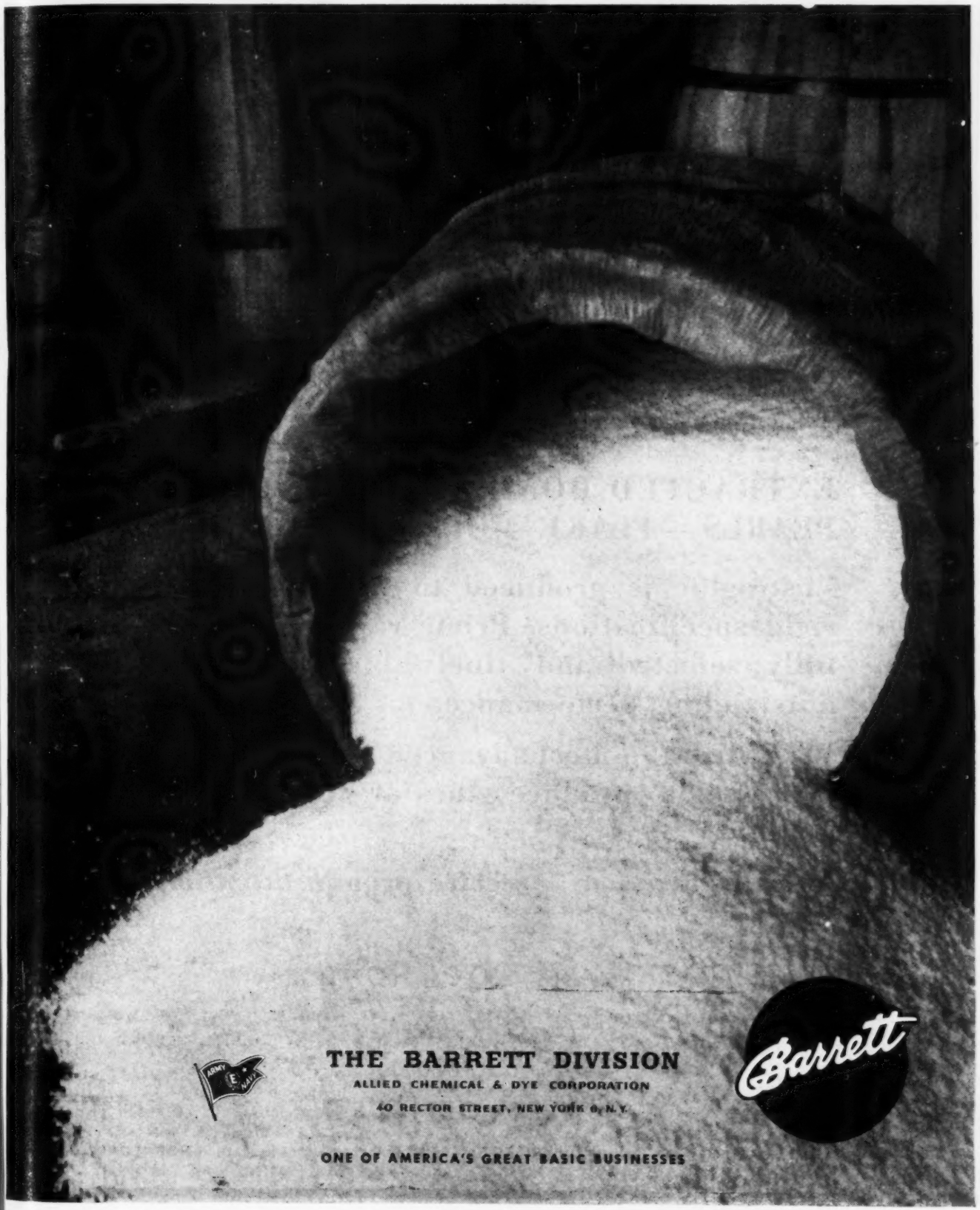
WAR PRODUCTION BOARD HAS ADVISED Rubber Reserve Company that synthetic rubber requirements from Government plants will run approximately 985,000 tons for this year, and for 1946 will be 1,176,000 tons.

Pending liberation of the enemy-held rubber-producing areas, it will be necessary for the Government synthetic plants to operate at a high rate, and the developments after the natural rubber areas are opened, it is stated, will determine the future of the synthetic industry and "ultimate destination of the Government's program."



PHTHALIC ANHYDRIDE

Pure white free-flowing flakes. Basic material for anthraquinone, dyes and pharmaceuticals; for ester-type plasticizers used in lacquers, synthetic rubber compounding and industrial coatings and for alkyd resins from which innumerable finishing materials for military equipment are made. Shipped in wooden barrels—even net weight 275 lbs—and in multi-wa'. paper bags—even net weight 80 lbs. *Your inquiries are invited.*


THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N.Y.
ONE OF AMERICA'S GREAT BASIC BUSINESSES
Barrett

CONSOLIDATED CHEMICAL INDUSTRIES INC.

ONE OF MANY

CCI *Products*

LUSTRAGLUE

REG. U. S. PAT. OFF.

EXTRACTED BONE AND HIDE GLUES
PEARLS — FLAKE — OPAQUE — GROUND

Lustraglue is produced to meet the most rigid specifications. Prime raw stocks carefully selected and finely blended insure outstanding performance.

We utilize the most advanced manufacturing processes to produce glues of uniform high quality.

Your inquiries will receive prompt attention.

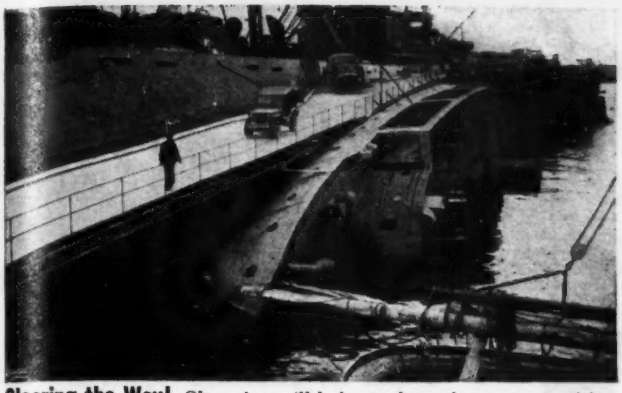
Awarded to the men and women of Consolidated's Baton Rouge plant for excellence in the production of war material.

PLANT LOCATIONS

SAN FRANCISCO, CAL. WOBURN, MASS. BASTROP, LA. BATON ROUGE, LA. FORT WORTH, TEXAS
HOUSTON, TEXAS LITTLE ROCK, ARK. BUENOS AIRES, ARGENTINA

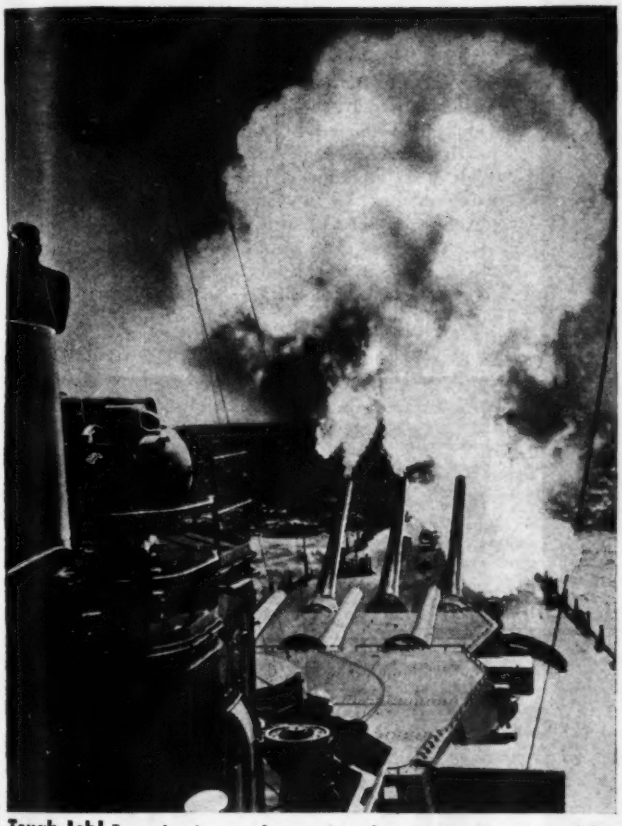
SALES OFFICES

SAN FRANCISCO, CALIFORNIA HOUSTON, TEXAS NEW YORK, N. Y.



Clearing the Way! Glycerine will help produce the vast quantities of explosives needed for postwar harbor clearance, building and rebuilding. One of the great reasons glycerine is used in making dynamite is that it doesn't separate from other materials.

The Road Back. The return to health is aided by C.P. glycerine, an important component in the making of many pharmaceuticals. Glycerine, the versatile solvent, humectant, carrier, has been proved safe in pharmaceuticals through generations of use.



Tough Job! Long-lasting modern paints for war equipment, and for widespread industrial and home use, are made with an alkyd resin base. Glycerine is important in the making of these resins.

Why Glycerine is Superior in ALKYD RESIN MANUFACTURE

Glycerine is—

Efficient. All three of the hydroxyl groups are reactive, yet reaction in the resin kettle is controllable. Glycerine-derived alkyds set to hard films, and have a low acid number.

High-boiling. It stays in the kettle.

Pure. When you buy glycerine, you aren't buying a mixture of polyhydroxy materials, or unwanted impurities — you buy just glycerine.

Glycerine has—

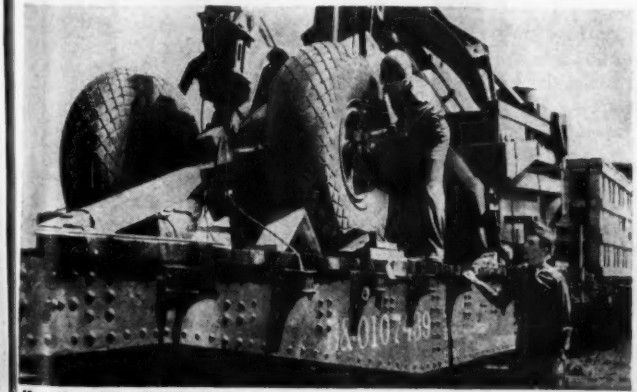
Complete availability of hydroxyl groups. No internal dehydration at ordinary kettle temperatures. You get full value with glycerine.

A long record of service to the resin industry. High utility, low price, unique properties.

Glycerine is valuable not only in the making of alkyd resins, but in hundreds of other products. Its high viscosity, high solvent power, compatibility, nontoxicity, permanence, and other advantages make it a superior humectant, plasticizer, solvent, preservative, lubricant, hydraulic fluid, and component in many essential materials.

GLYCERINE PRODUCERS' ASSOCIATION

295 Madison Avenue, New York 17, N. Y., Research Laboratories, Chicago, Ill.



Keeping 'Em Rolling! Glycerine is used in the processing of synthetic and natural rubber goods and many other important war materials. You, too, can use glycerine in your products!

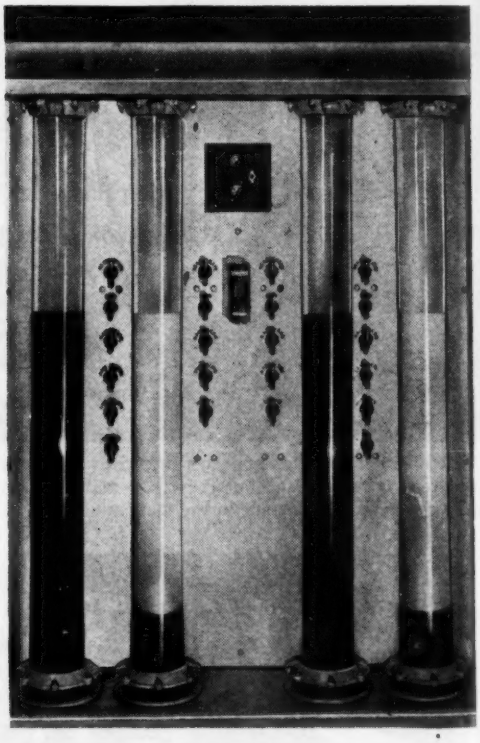
Scientific Nutrition. Many foods, food products, and food-packaging materials call for the use of C.P. glycerine — which is a natural product — and a food itself. Use wholesome *glycerine!*

LIFE On The

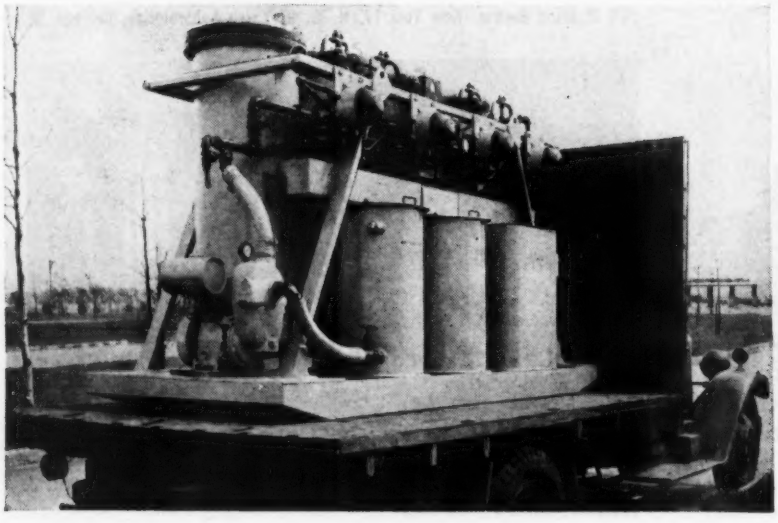
FILT-R-STIL** DEMINERALIZING UNITS UTILIZE ION EXCHANGE PRINCIPLE

By means of ion exchange using Cyanamid IONAC** Resins, brackish water containing up to 4,000 parts per million, or even higher, of dissolved salts can be transformed into mineral-free water.

Equipment consists essentially of four treating columns containing IONAC resins. In the first column dissolved salt meets a cation exchanger which captures the sodium ion and frees the chloride ion. In the second chamber the chloride ions are removed by an anion exchanger. The cation exchanger in the third column splits any salts that have leaked through and removes the sodium ions. In the last column another anion exchanger absorbs any remaining free acids in the third bed. The resulting demineralized water may contain less than 2 parts per million of ionizable salt. It will be neutral, having a pH of 6.5-7.5.



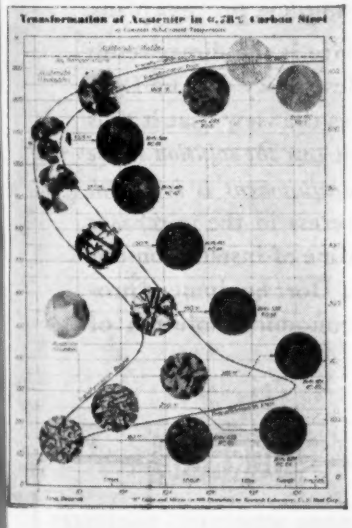
(*Above*) **FILT-R-STIL "LAB" UNIT** rated at 30 gallons per hour to supply demineralized water for applications where water demand is small.



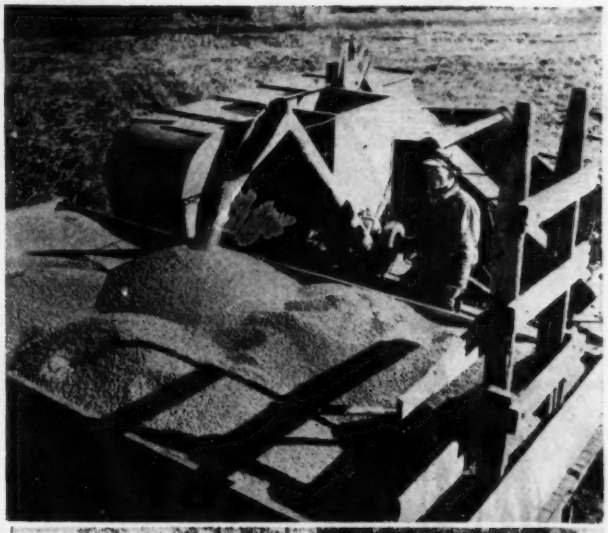
(*Left*) **FILT-R-STIL POTABLE WATER UNITS,** producing 150 to 600 gallons per hour, may be mounted on skids, movable by truck. Industrial water demineralizing units with larger capacities for special requirements are also available.

Chemical Newsfront

(*Above*) **SURPRISE PACKAGE!** One of the most interesting postwar improvements in frozen foods will be new wet-strength paper packages and wrappings. High wet strength, as well as wet-rub resistance, can now be imparted to any type of paper, from paperboard to fine tissue with PAREZ* synthetic resin developed by Cyanamid. Its success in essential war papers promises many improvements in future paper products.



(*Left*) **"S" CURVE AND PHOTOMICROGRAPH,** showing the transformation of austenite in 0.78% carbon steel during isothermal heat treating. A comprehensive, up-to-date reference list of "S" and "TTT" curves covering 187 different steels is included in a new metallurgic manual published by Cyanamid, "*Isothermal Heat Treating—Austempering • Martempering,*" and also the uses of a series of salt baths developed by Cyanamid for heat treating, AEROHEAT** 1000 and 1200 for heating and AEROHEAT 300 and 400 for quenching.



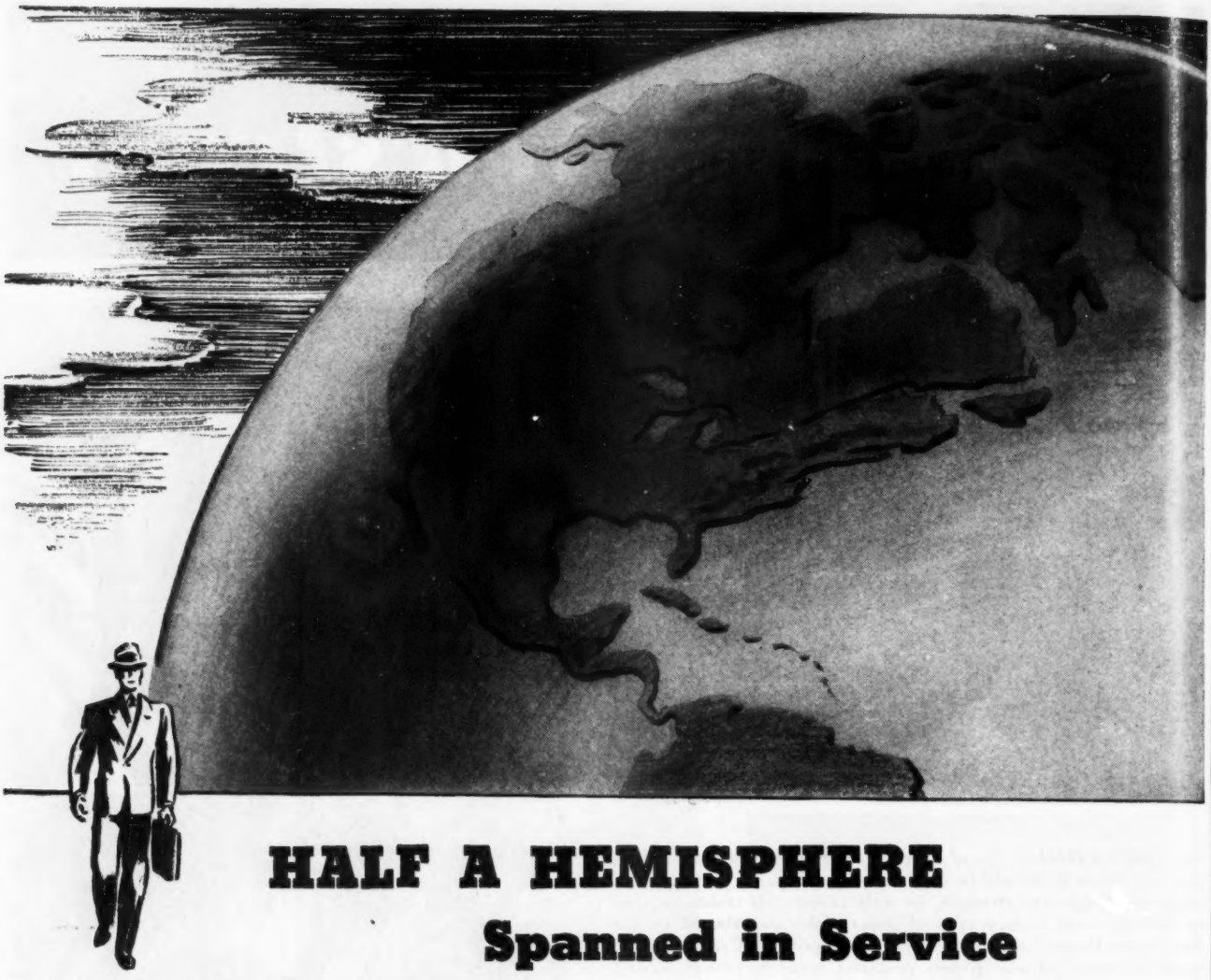
(*Above*) **FROM THE SOYBEAN FARMS OF AMERICA** to the olive groves of the Mediterranean and from other far and varied latitudes, stretch the sources of supply on which Cyanamid draws for its production of sulphonated oils for the textile and other industries. In normal times, tea seed oil is imported from China, cocoanut oil from the Pacific islands, babassu and rapeseed oil from South America, sperm oil from the Arctic. Domestic oils include castor oil, peanut oil, corn oil, cottonseed oil, and soybean oil. All oils are carefully processed to assure high quality and uniformity.

*Reg. U. S. Pat. Off.
**Trade-Mark

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK 20, N. Y.



HALF A HEMISPHERE
Spanned in Service

To users of Dorr equipment in all fields throughout the North American Continent, The Dorr Company offers quick, expert, engineering service... to a water works in Mexico, a sugar central in Cuba, a sewage disposal plant in Newfoundland, a paper mill in Quebec or a gold mine in Alaska.

The Dorr Company maintains a staff of thoroughly trained engineers at strategic points throughout *half a hemisphere* to render immediate service wherever and whenever needed... service in all fields to all Dorr installations whether they consist of a single piece of equipment or a complete process plant.

This extensive service is the direct result of a fundamental sales policy of The Dorr Company—Dorr takes the view that it sells not merely equipment but *the solution to the problem for which the equipment is intended.* Therefore, Dorr's interest in the purchaser does not end at the time of installation but continues far beyond. Dorr equipment provides an efficient, economical solution of the client's problem.

Avail yourself of Dorr's comprehensive knowledge of a wide variety of fields; gain the advantage of the service of Dorr engineers; take up your process equipment problem with The Dorr Company.

8122

DORRCO

THE DORR COMPANY, ENGINEERS

NEW YORK 22, N. Y. . . . 570 LEXINGTON AVE.
ATLANTA 3, GA. . . . WILLIAM-OLIVER BLDG.
TORONTO 1, ONT. . . . . 80 RICHMOND ST. W.
CHICAGO 1, ILL. . . . . 221 NO. LA SALLE ST.
DENVER 2, COLO. . . . . COOPER BUILDING
LOS ANGELES 14, CAL. . . . . 811 WEST 7TH ST.

RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.

SUGAR PROCESSING
PETREE & DORR DIVISION
570 LEXINGTON AVE., NEW YORK 22

RESEARCH ENGINEERING **DORR** EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

WOOD STAINS

The use of "Carbitol" in the preparation of non-aqueous stains prevents raising of the grain of the wood.

WATER PAINTS

Because "Carbitol" is soluble in both oil and water, it is used in water paints to eliminate the oily float.

carbitol

TRADE-MARK

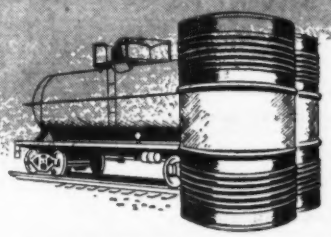
a utility solvent for

TEXTILE OILS

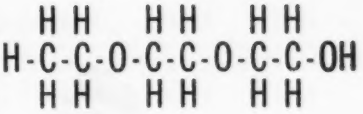
Because of its ability to penetrate textile fibers, its low vapor pressure, and high boiling point, "Carbitol" is well suited for the setting of twist and conditioning of yarns.

DYESTUFFS

Good penetration, and deep and bright shades result when "Carbitol" is employed in the printing and dyeing of textiles.



DATA ON "CARBITOL"



A stable, water-white liquid . . .
both an ether and an alcohol . . .
readily dissolves nitrocellulose, hydrocarbons, linseed oil, shellac, and many resins . . .
boils at 201.9°C. . . . miscible with water in all proportions . . .
vapor pressure at 20°C. is 0.2 mm. Hg.

Write for prices and further information.

BUY UNITED STATES WAR BONDS AND STAMPS

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York 17, N. Y.

SYNTHETIC ORGANIC CHEMICALS

VELSICOL

Improved

AROMATIC PETROLEUM SOLVENTS

VELSICOL offers improved aromatic hydrocarbons in all boiling ranges to meet your specific requirements. They are available in narrow or wide fractions with initial boiling point from 90°F. to end point of 650°F., in drum or tank car quantities. Velsicol solvents serve as replacements for the coal-tar naphthas in the benzol, toluol, xylol, high-flash naphtha and higher ranges. Write or call for samples and complete information; address Department M.

We list below physical specifications of a typical Velsicol Solvent of high aromaticity.

VELSICOL SOLVENT No. 34	
Sp. Gr. @ 15.5°C.	.8602-.8762
Flash Point T.C.C.	Min. 90°F.
Kauri Butanol Value	75-80 (Toluol = 100)
Mixed Aniline Point	73-77°F.
A.S.T.M. Distillation	
I.B.P.	300-315° F.
5%	305-320°
50%	340-355°
90%	375-390°
F.B.P.	385-400° F.

VELSICOL Corporation

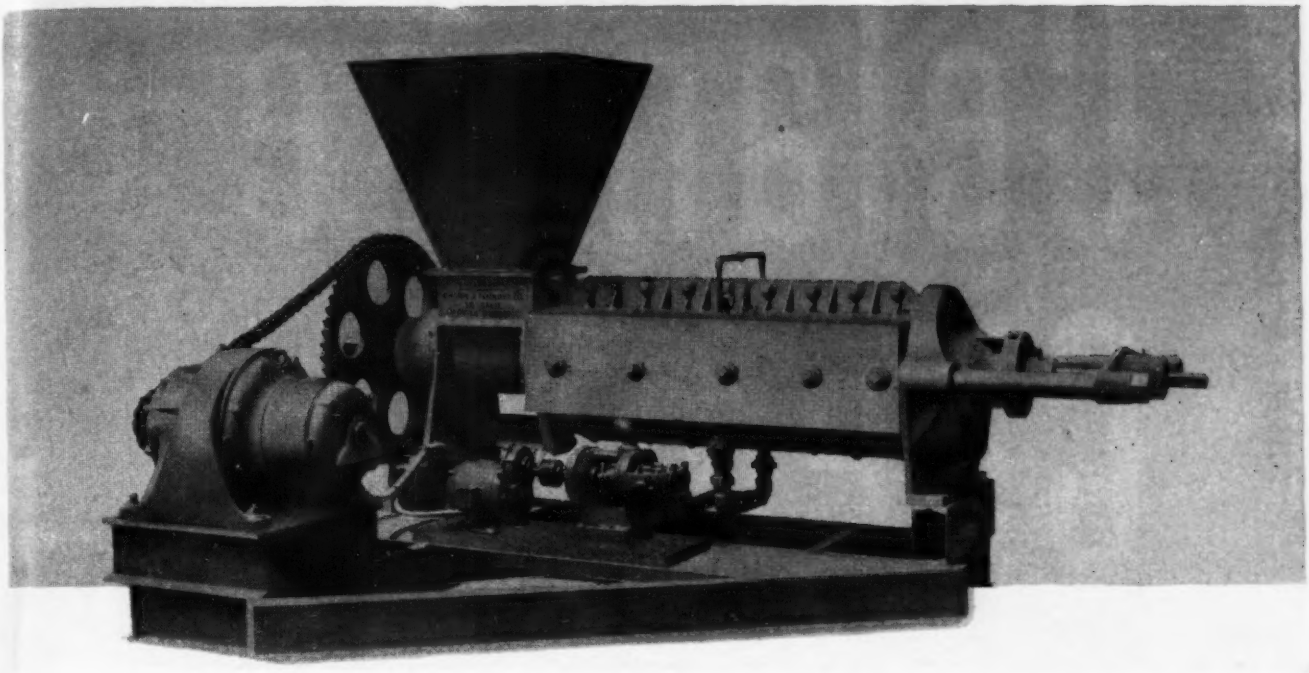
General Offices: 120 East Pearson Street, Chicago 11, Illinois

Manufacturers of

Hydrocarbon Resins • Insecticides • Coresin Core Oils • Aromatic Solvents

AN IMPORTANT ANNOUNCEMENT

to all industries using machinery for extraction of fish oils, juices and moisture . . .



Money-saving . . . more efficient . . . *NEW* . . .

The ENTERPRISE Vacuum Screw Press

The Enterprise Vacuum Screw Press is new . . . different from any other mechanical means of extracting fish oils, juices and moisture. This improved-design press is exactly what its name implies . . . *a vacuum screw press* . . . utilizing for the first time, *both* screw action *and* vacuum suction pressure to permit greater extraction of fish oils and juices.

- **REMOVES *MORE* MOISTURE**—The Enterprise Vacuum Screw Press removes more oils and juices than conventional mechanical presses. As a result, the press cake has a far lower moisture content . . . requires less heat for drying . . . lowers your fuel bills.
- **LABOR-SAVING**—The continuous screw action permits uninterrupted operation . . . saves time, labor, money. The Enterprise Vacuum Screw Press is lower in cost to buy and operate than conventional hydraulic presses.

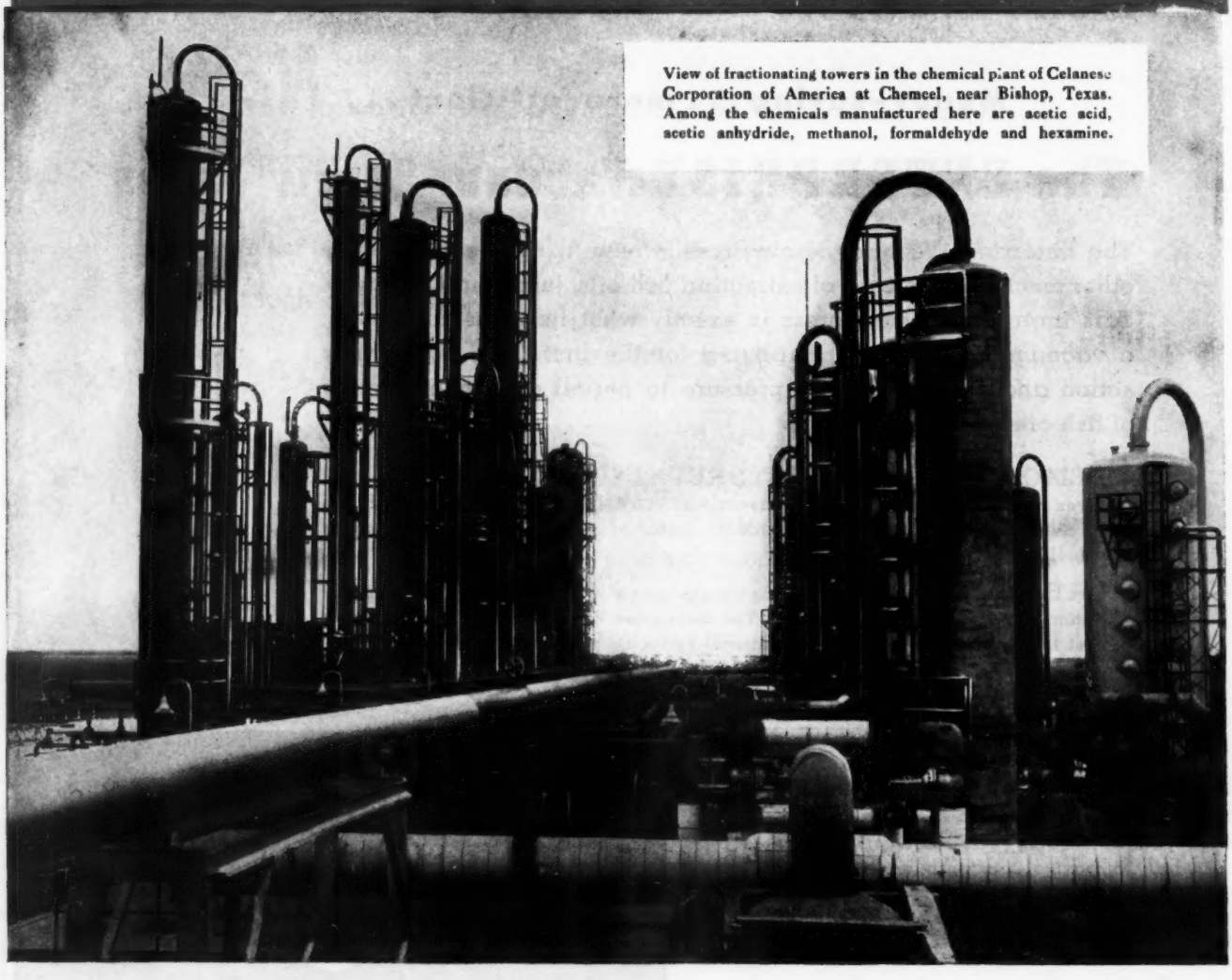
WRITE TODAY FOR INFORMATION

The Enterprise Vacuum Screw Press has been developed in keeping with Enterprise policy of constantly improving, constantly providing process industries with better, more efficient equipment. For detailed information on the new Vacuum Screw Press, write Dept. S. P.-1.

PROCESS MACHINERY DIVISION
OF
ENTERPRISE ENGINE & FOUNDRY CO.
18th & Florida Streets — San Francisco, California
Enterprise Process Machinery

SCREW COOKERS · DRYERS · VERTICAL MILLS

Celanese Chemicals *



View of fractionating towers in the chemical plant of Celanese Corporation of America at Chemcel, near Bishop, Texas. Among the chemicals manufactured here are acetic acid, acetic anhydride, methanol, formaldehyde and hexamine.

CELANESE CORPORATION OF AMERICA

The proof of Celanese research is in expanded production . . .

THE PROGRESS of Celanese research in synthetics—the ever-increasing search for new materials precisely suited to advanced industrial needs—is demonstrated by the latest addition to Celanese production facilities, a new chemical plant near Bishop, Texas.

This modern plant, where some units are already beginning operation, is close to important sources of petroleum and natural gas, the major raw materials for synthetics. This expansion in the important hydrocarbon field will greatly increase the potentials of Celanese research and production.

Acetaldehyde, acetone, formaldehyde and methanol are among the base chemicals that will be produced by the most modern methods. Conversion of these basic chemicals into various advanced compounds can serve a broad range of important industrial uses.

For instance, resins, adhesives, lacquers and plasticizers for the ever-growing plastics and electronics fields—for synthetic rubber, paper products, packaging, textiles and many others. In addition—preservatives, essential oils, dyes, specialized solvents and cleaning compounds, emulsions of many types, advanced chemicals for the drug industry.

In these applications Celanese research will meet the demands of chemical engineers with the same precision demonstrated in those versatile products, the Celanese organic phosphates—Lindol*, Lindol E.P., Lindol M.P., Celluflex* and Cellulube*.

PLASTICIZERS

ORGANIC PHOSPHATES

LUBRICANT ADDITIVES

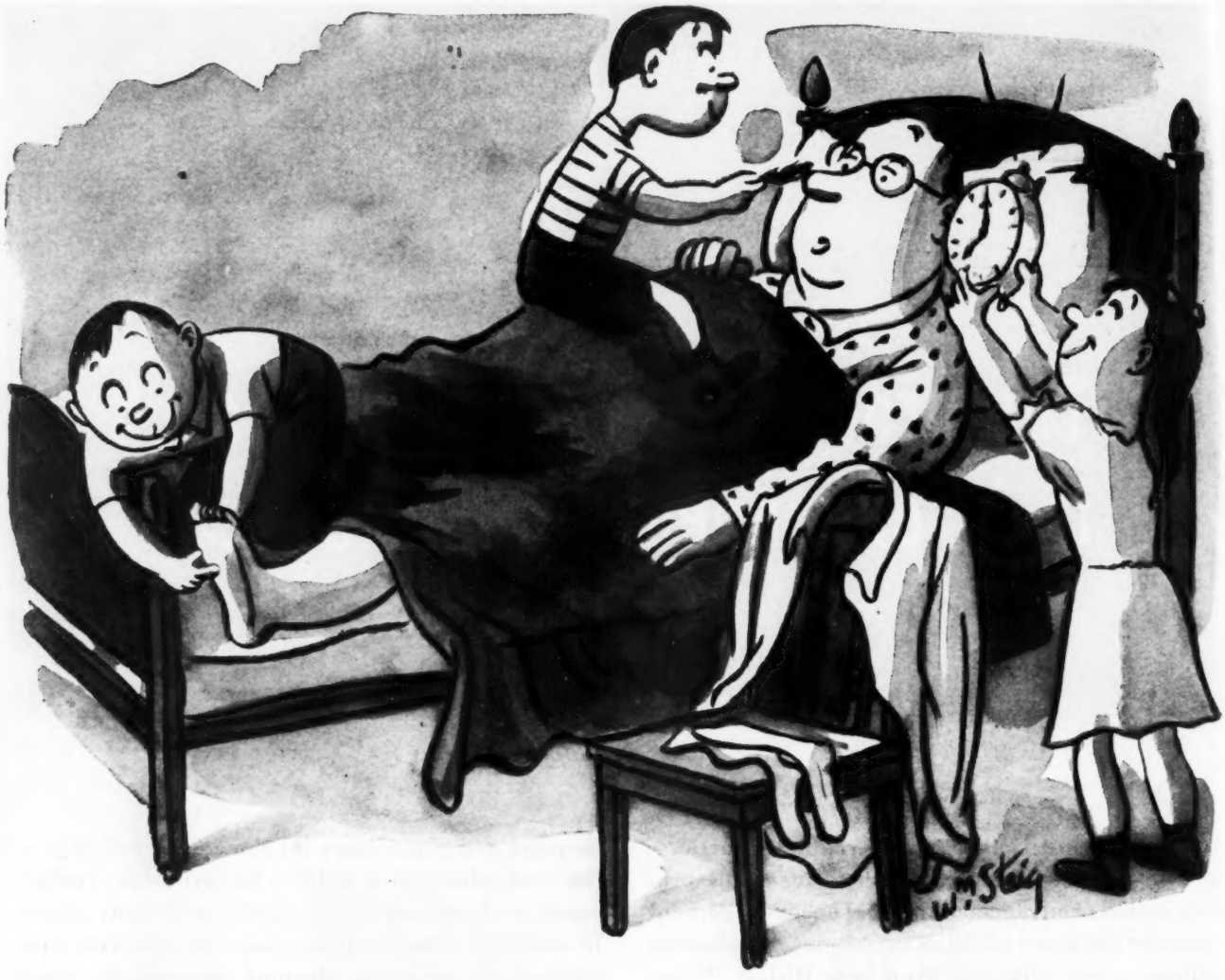
INTERMEDIATES

DYE-STUFFS

It is to individual requirements of industry that Celanese research is especially devoted. Inquiries are welcome in terms of specific objectives. Celanese Chemical Corporation, a division of Celanese Corporation of America, 180 Madison Avenue, New York 16, N. Y.

*Reg. U. S. Pat. Off.

TEXTILES • PLASTICS • CHEMICALS



"The bigger the family—the better the service"

NEARLY every large family or business proves it! Continental's family will give you perfect packaging service. We've got the facilities and personnel to do it. We'll analyze your problem impartially and come up with the ideal package.

We can meet your needs, for now we cover every phase of packaging—metal containers, liquid-tight paper cups and containers, fibre cans and drums, steel pails and other heavy duty containers.

Uncle Sam is our chief customer now. But keep your eye on Continental! And on Continental's trade-mark, too! It stands for *one* company with *one* policy —to give you only the best in quality and service.

Tune in: "REPORT TO THE NATION" *every Sunday over coast-to-coast CBS network*

CONTINENTAL CAN COMPANY, INC.

PAPER DIVISION

FIBRE DRUMS The Container Co., Van Wert, Ohio

LIQUID-TIGHT FOOD CONTAINERS — Boothby Fibre Can Co., Roxbury, Mass.

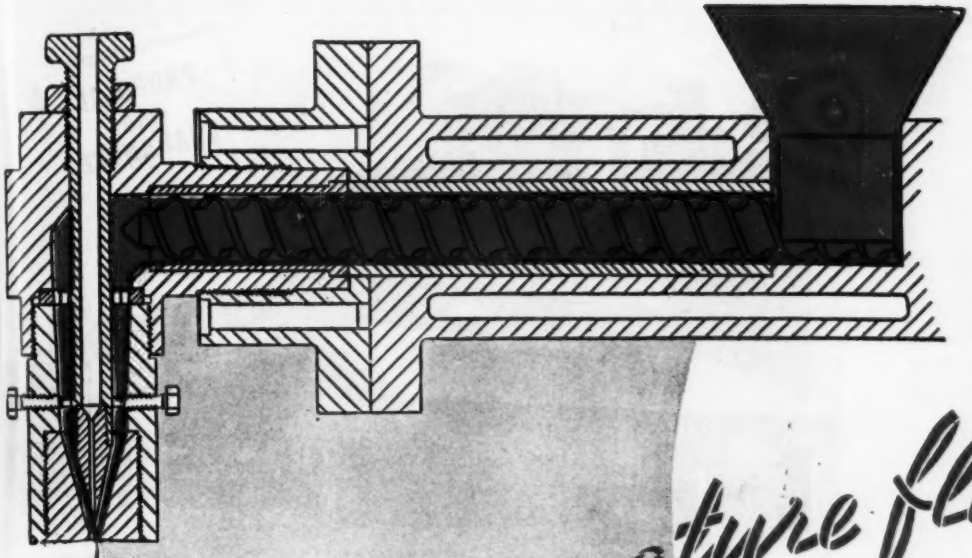
PAPER CUPS AND FOOD CONTAINERS — Mono Containers, Newark, N. J.

COMBINATION PAPER AND METAL CONTAINERS

Headquarters: 330 W. 42d St., New York 18, N.Y.

13 Plants—Sales offices in all principal cities

Continental Fibre Drums—Continental makes a full line of fibre drums, both the all-fibre and the metal-end types, for shipping chemical and pharmaceutical products. "FIBERPAK," an all-fibre drum (from ¾ gal. to 67 gal. capacity), and "LEVERPAK" illustrated, (from 12 gal. to 75 gal. capacity), for fine chemicals and similar expensive materials; "STAPAK" Drums (from 2 gal. to 32 gal. capacity) for less costly materials such as soap powders, cleansers, colors, detergents. Wide selection of linings, coatings, treatments and constructions to meet specific requirements.



Low temperature flexibility

BAKER

PLASTICIZERS•

for EXTRUDED *compounds*

VINYL RESINS

CELLULOSE RESINS

BUNA-S BUNA-N

NEOPRENE

THE

BAKER CASTOR OIL COMPANY

ESTABLISHED 1857

120 BROADWAY, NEW YORK 5, NEW YORK

CHICAGO, ILLINOIS LOS ANGELES, CALIFORNIA

• CONTAIN NO PHTHALATE

GUARANTEE OF RESULTS IN CHEMICAL PLANT PRODUCTION

You don't buy a "pig in a poke" when you accept the recommendations of the CHEMICO engineers for a plant for the production or recovery of sulphuric acid or other acids or heavy chemicals.

Every CHEMICO project is covered by an overall guarantee of quality and performance. This guarantee is reliable because it is based on the results obtained in dozens of CHEMICO plants all over the world, and is made by an organization with unequalled facilities and resources in the field of chemical plant process development, design and construction.

CHEMICO is prepared to select or develop processes, to furnish all equipment, and to design and erect the complete plant. Whether your requirements for acids or heavy chemicals are moderate or large, you will find it advantageous to consult the CHEMICO engineers . . . your inquiry will receive prompt attention.

CHEMICAL CONSTRUCTION CORP.

EMPIRE STATE BLDG., 350 FIFTH AVE. • NEW YORK 1, N. Y.

European Repr.: Cyanamid Products, Ltd., Berkhamsted, Herts; Engl.

Cables: Chemiconst, New York

The 6-Point Chemico Service

1. Analysis of individual plant conditions
2. Selection of processes
3. Layout and design of plant
4. Erection of plants
5. Training and initial supervision of crew
6. GUARANTEE OF RESULTS

CHEMICO CHEMICAL PLANTS ARE PROFITABLE INVESTMENTS

ISOPROPYL ALCOHOL

(ISOPROPANOL)

$CH_3-\overset{OH}{\overset{|}{C}}H-CH_3$

Molecular Weight 60.09

Extensively used in many industries, Isopropyl Alcohol and its derivatives find uses in a wide variety of processes . . . such as concentrating copper ores, making brake fluid, deicing fluid for aircraft, preparation of pectin from citrus products.

Because of its latent solvent powers and quick-drying quality, Isopropyl Alcohol is widely used in making nitrocellulose lacquers and coatings; also in photographs and electroplating.

Isopropyl Alcohol's effective antiseptic range of 30% to 50% makes it economical for hospital and surgical uses. Diluted with 30% water, it is successfully used as a rubbing alcohol.

Sugars, starches, animal and vegetable tissues, gelatine, etc., can be effectively dehydrated with the aid of Isopropyl Alcohol.

Can you utilize Isopropyl Alcohol in your processes? Inquiries are invited

SPECIFICATIONS

Purity . . .	Minimum 99% isopropyl alcohol by weight
Specific Gravity 20°/20° C.	0.785 to 0.787
Color	Maximum 10 platinum cobalt (Hazen) standard
Water	Miscible without turbidity with 19 volumes of 60° Bé. gasoline at 20° C.
Acidity (other than carbon dioxide) .	Maximum 0.002% calculated as acetic acid
Distillation Range . . . . (A.S.T.M. D268/33) . .	Below 81° C. None Above 83° C. None
Non-volatile matter .	Maximum 2 mg. per 100 ml.
Water Solubility . . .	Completely miscible with distilled water
Weight	6.55 lbs. per gallon at 20° C. (approx.)

PHYSICAL PROPERTIES

Several of the physical properties of isopropyl alcohol are given in the following table:

Specific Gravity at 20°/4° C.	0.7848
Boiling Point at 760 mm.	82.3° C.
Melting Point	—89.5° C.
Flash Point, Tag Open Cup	69° F.
Tag Closed Cup	56° F.
Vapor Pressure at 0° C.	7.6 mm. Hg.
10° C.	15.9 " "
20° C.	31.5 " "
30° C.	58.8 " "
Specific Heat	0.595 (20° C.)
Refractive Index, N_D^{20}	1.37757
Coefficient of Expansion . . .	0.000630 per °F.
Latent Heat of Vaporization . .	159.2 gm. cal. per gm.
Heat of Combustion . . .	7950 gm. cal. per gm.

Azeotropic Data: Isopropyl alcohol forms a constant boiling mixture with water at 80.2° C., containing 87.7% by weight of compound.

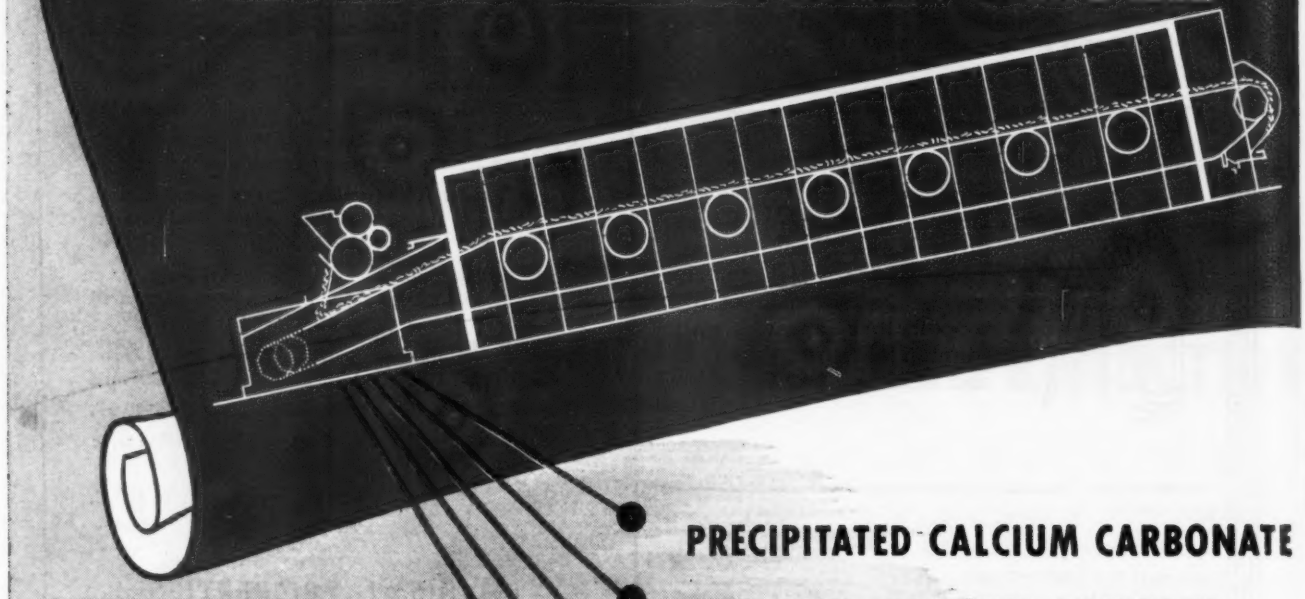
For further properties and uses communicate with either of the addresses below

SHELL CHEMICAL Division of SHELL UNION OIL CORPORATION
100 BUSH ST., SAN FRANCISCO 6, CALIFORNIA

R.W. GREEFF & CO. *Eastern Sales Agent* 10 ROCKEFELLER PLAZA, NEW YORK 20. TRIBUNE TOWER, CHICAGO 11

Five Typical Applications for one type

PROCTOR AEROFORM DRYER



All results of PROCTOR RESEARCH

- PRECIPITATED CALCIUM CARBONATE
- LEAD AND CALCIUM ARSENATE
- MAGNESIUM CARBONATE
- WHITE LEAD
- ZINC OXIDE

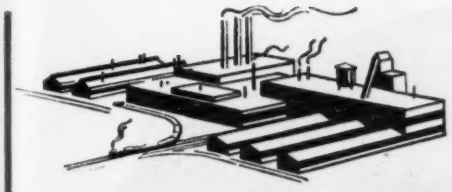
These five chemicals are typical of the materials being dried in large scale commercial installations of the Proctor Aeroform Dryer, with the automatic Fin Drum Feed.

With this continuous system, the material to be dried is delivered to the hopper of the fin-drum feed in a wet-solid state, after filtering or some other means of mechanical dewatering. The material, in this wet-solid state, is pressed, by means of rollers, into the grooved surface of the internally heated, revolving fin drum which forms the feeding device for the dryer. In this way, the material is dried sufficiently to be discharged, from the drum, to the conveyor of the dryer, in the form of small sticks—of uniform thickness. Circulation of heated air *through* the bed of pre-formed sticks on the moving conveyor, makes possible rapid, uniform and thorough drying.

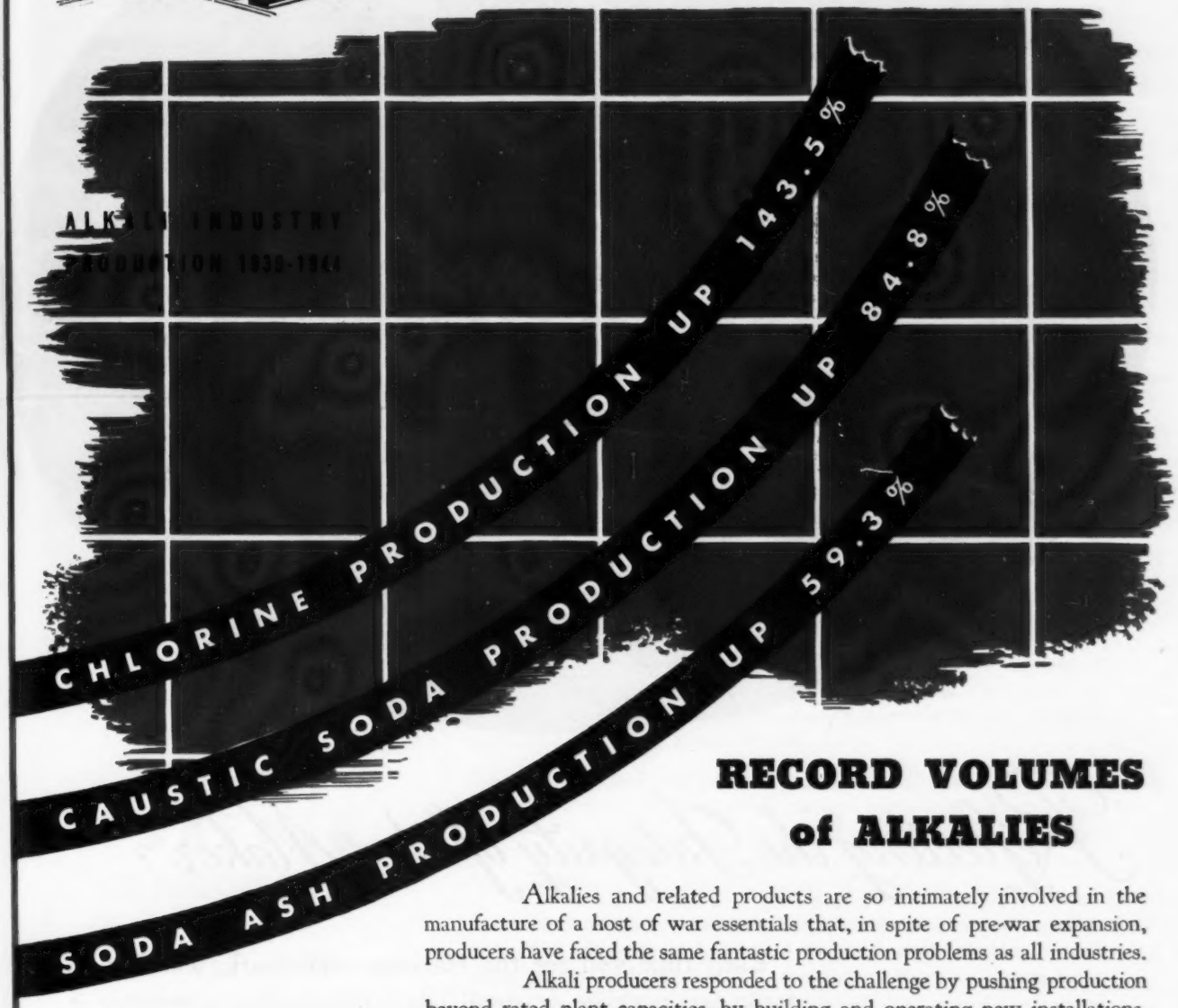
In each case where one of these drying systems is in operation, it is the direct result of Proctor research. Before being installed, it was determined in the laboratory, that this was the system most ideally suited to the product to be dried. Every step in the development of the system was taken with consideration for how it would effect the ultimate operation of the system.

Because of the accurate findings of Proctor research engineers—it was possible, in each case, to guarantee the performance of the system. The five chemicals named are typical of those being dried efficiently in only one type Proctor dryer. If drying is a part of your manufacturing process—let Proctor engineers consider your needs. Their recommendations may well save you hours of production time and reduce your costs materially. The system they recommend will be "tailor-made" in every respect to meet your product or plant requirements.

PROCTOR & SCHWARTZ • INC • PHILADELPHIA 20 • PA.



To the Nation's War Plants—



RECORD VOLUMES of ALKALIES

Alkalies and related products are so intimately involved in the manufacture of a host of war essentials that, in spite of pre-war expansion, producers have faced the same fantastic production problems as all industries.

Alkali producers responded to the challenge by pushing production beyond rated plant capacities, by building and operating new installations. The resulting record production has helped to keep war materials moving and to care for most civilian needs.

As long as military requirements remain at peak levels, supplies of such chemicals as Chlorine, Soda Ash and Caustic Soda will, of course, remain critical or "tight." But Columbia is pledged to continue to devote its full energies toward providing superior service to its customers.

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY • COLUMBIA CHEMICAL DIVISION

GRANT BUILDING, PITTSBURGH 19, PENNSYLVANIA

Chicago • Boston • St. Louis • Pittsburgh • New York • Cincinnati • Cleveland • Philadelphia • Minneapolis • Charlotte • San Francisco

COLUMBIA CHEMICALS ESSENTIAL FOR INDUSTRIES, INCLUDING:

Aluminum • Chemicals • Explosives • Foods • Pulp & Paper • Petroleum Refining • Rayon • Refrigeration
Soap & Detergents • Steel • Textiles • Water & Sewerage Treatment

Reflecting the Integrity of the Maker :

Each time you see the Harshaw trademark, whether on tank car, package or small laboratory bottle, remember it identifies chemicals that will help to do a better job . . . truly reflecting the integrity of the maker. • Harshaw will always guard the quality of its chemicals . . . chemicals which you identify by the Harshaw trademark . . . and which you buy with confidence. For more than 50 years Harshaw has persevered in ceaseless research and field investigation. As a result, thousands of manufacturers have been supplied with hundreds of different chemicals which have helped them . . . and which in addition have proved a source of satisfaction to them and to us.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

THE **HARSHAW CHEMICAL** CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

FIRE!

The Most Terrifying of All Cries

Heartrending loss of life and needless waste of matériel need NOT happen because of dangerous inflammable textiles. Particularly in places where people congregate, every precaution should be taken to prevent the danger of fire.

The need for fabric treated so as to render it resistant to fire, water, and mildew became acute when the war broke out. Now, in every corner of the globe, canvas, duck, and other textiles, impregnated with Naylee **Naypar** Chlorinated Paraffin is helping to save many lives and millions of dollars in matériel for our armed forces.

Tested and approved—successfully used in the impregnation along with other pigments of millions of yards of materials, Naypar has demonstrated its dependability under the most trying conditions. Now, **Naypar** is ready to do a job for you—noted for its stability, uniformity and compatibility and the fact that it is miscible in a wide range of solvents makes possible a much broader application for Chlorinated Paraffin. This would indicate many new uses in other fields. Consult us with your problems, our chemists may be able to help you determine the suitability of Naylee **Naypar** to your product. Write for FREE, informative folder, giving complete technical information on **Naypar.**

NAYLEE
NAYPAR
CHLORINATED PARAFFIN
FOR
FIREPROOF
WATERPROOF
AND
MILDEW-PROOF
COATINGS

NAYLEE
CHEMICALS FOR INDUSTRY

NAYLEE CHEMICAL COMPANY
Frankford Ave. & Rhawn St., Philadelphia 36, Pa. **Warehouses from Coast to Coast**
CHLORINATED HYDRO CARBONS • MURIATIC ACID • WETTING AGENTS • TUBE DRAWING COMPOUNDS

BIG MEN ARE MADE IN TIMES LIKE THESE...

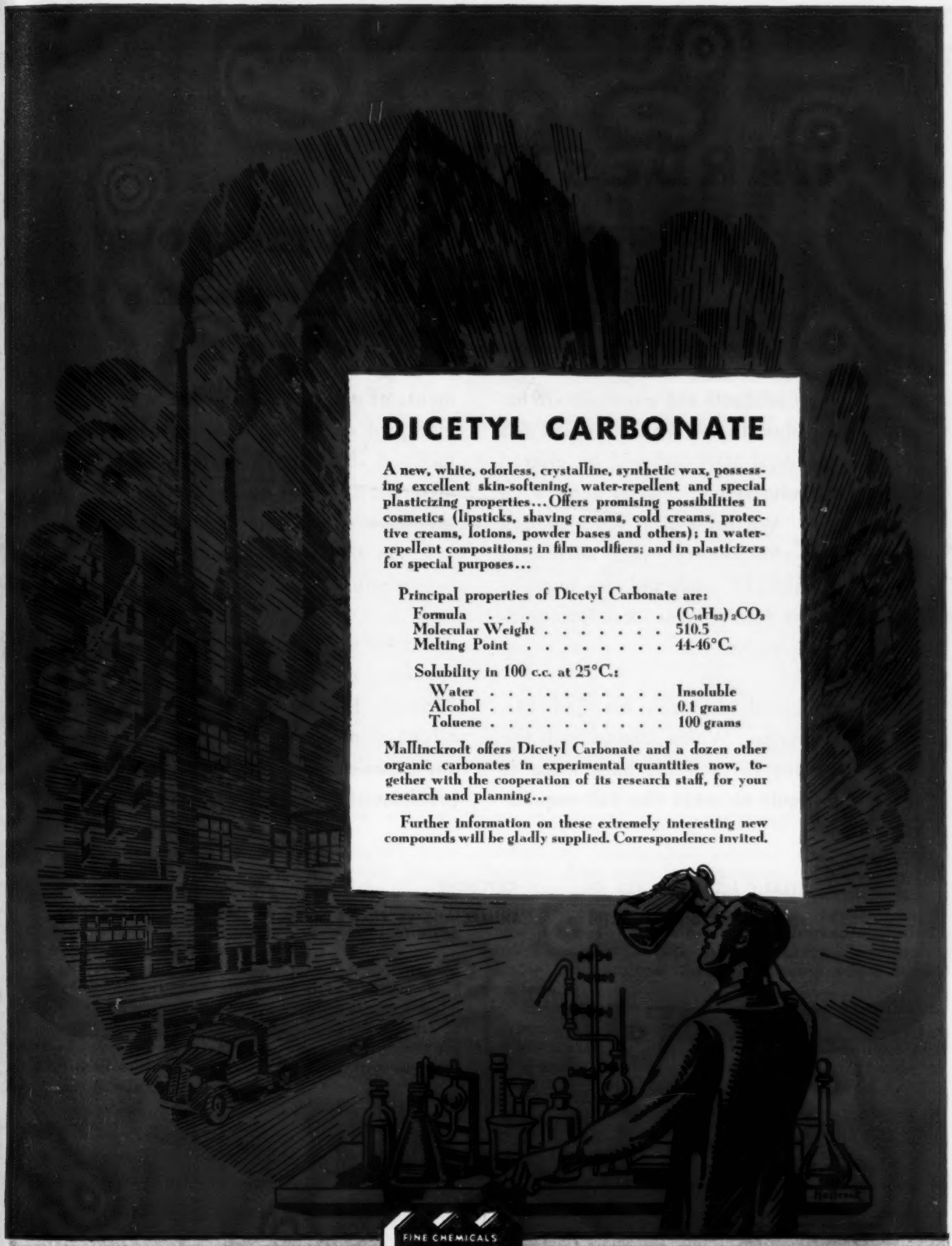
OUT of trying times emerge big men—leaders in every line of effort—because these men are able to visualize and plan for the future. Today is taken in their stride and Tomorrow brings them success because they are ready for it. In your plans . . . in your future . . . there is a place for Heekin Metal Packages . . . lithographed in color. Right now our batteries of high speed presses work day and night for Uncle Sam and his children. Heekin color lithography is outstanding. If you need rapid, large volume production on a package used in Defense, we can serve you quickly . . . efficiently. In the meantime—Look Ahead.

THE HEEKIN CAN CO., CINCINNATI, OHIO

HEEKIN CANS

Lithographed Cans

WITH HARMONIZED COLORS



DICETYL CARBONATE

A new, white, odorless, crystalline, synthetic wax, possessing excellent skin-softening, water-repellent and special plasticizing properties... Offers promising possibilities in cosmetics (lipsticks, shaving creams, cold creams, protective creams, lotions, powder bases and others); in water-repellent compositions; in film modifiers; and in plasticizers for special purposes...

Principal properties of Dicetyl Carbonate are:

Formula	$(C_{16}H_{33})_2CO_3$
Molecular Weight	510.5
Melting Point	44-46°C.

Solubility in 100 c.c. at 25°C.:

Water	Insoluble
Alcohol	0.1 grams
Toluene	100 grams

Mallinckrodt offers Dicetyl Carbonate and a dozen other organic carbonates in experimental quantities now, together with the cooperation of its research staff, for your research and planning...

Further information on these extremely interesting new compounds will be gladly supplied. Correspondence invited.

MALLINCKRODT CHEMICAL WORKS

78 Years of Service — *to Chemical Users*

FINE CHEMICALS Mallinckrodt SINCE 1867

Mallinckrodt St., St. Louis 7, Mo. • 72 Gold St., New York 8, N.Y.

CHICAGO • PHILADELPHIA • LOS ANGELES • MONTREAL

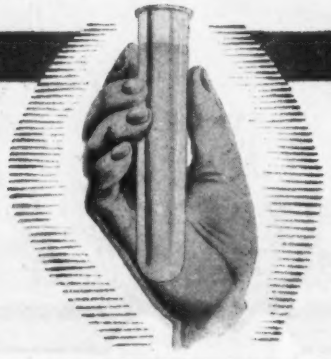
HARDESTY
is planning for tomorrow ... today

New products and processes are being developed by HARDESTY'S technical staff and will be offered to industry immediately upon war's end. Whatever plans you may have for the future, you will find HARDESTY ready and able to assist you in turning your ideas into practical results.

Increased demands for Red Oil, Glycerine, White Oleine and the various Fatty Acids have made it difficult to meet the full requirements of every consumer, but with increased capacities and improved facilities, HARDESTY is delivering materials of better quality and with the same considerate service that has won the confidence of buyers everywhere.

Our many years of experience in the chemistry of Fatty Acids is at your disposal. HARDESTY is ready with a fund of new technical knowledge and experience to assist you in the problems of peacetime competition.

STEARIC ACID RED OIL GLYCERINE PITCH WHITE OLEINE
HYDROGENATED FATTY ACIDS ANIMAL AND VEGETABLE DISTILLED FATTY ACIDS



HARDESTY

W. C. HARDESTY CO.
41 EAST 42nd STREET • NEW YORK 17, N.Y.
FACTORIES: DOVER, OHIO · LOS ANGELES, CALIF. · TORONTO, CANADA

Sharples Research... PIONEERING FOR THE FUTURE

The first transatlantic cable to transmit messages, a project inspired by Cyrus W. Field of New York, was laid in 1857. This was his second attempt. His third project, in 1865, was completely successful.

MOST great accomplishments of history have not been successful on the first trial. Perseverance—the determination to find the most suitable conditions and materials for the job—has resulted in innumerable instances of outstanding and beneficial achievement.

In the class of acid amides, members of varied properties may be obtained by proper choice of alkylating groups and acids used in their synthesis. The compounds described below represent a few of the possible members of this series.

The acid amides are suggested for evaluation as plasticizers for vinyl resins, ethyl cellulose, chlorinated rubber, and other synthetic elastomers and plastics. They may be worthy of evaluation also for production of insecticides and surface active agents—soaps and cosmetics—synthesis of pharmaceuticals—lubricants for textile manufacture. Their properties may suggest them for many other applications.

Although the amides are available now only in experimental quantities, future production on a commercial basis is planned when conditions permit. Samples will be sent upon receipt of your request on company letterhead.

NEW SHARPLES ACID AMIDES

Compound	Formula	Mol. Wt. (Calcd.)	Melting Range °C.	Boiling Range °C.	Sp. Gr. at 20/20° C.	Color
Butylstearamide	$CH_3(CH_2)_{16}CONHC_4H_9$	339.6	67-70	195-200 at 2 mm.	0.869	Lt. Straw
Dibutylstearamide	$CH_3(CH_2)_{16}CON(C_4H_9)_2$	395.7	4	173-175 at 0.4 mm.	0.860	Straw
Diethyllauramide	$CH_3(CH_2)_{10}CON(C_2H_5)_2$	255.4	4	166-167 at 2 mm.	0.868	Water White

Sharples Chemicals Inc.

PHILADELPHIA • CHICAGO • NEW YORK

SHARPLES SYNTHETIC ORGANIC CHEMICALS

PENTASOL* (AMYL ALCOHOLS)
PENT-ACETATE* (AMYL ACETATE)
PENTALARM* (AMYL MERCAPTAN)
BURAMINE* (BUTYL UREA, Tech.)
PENTAPHEN* (p-tert-AMYL PHENOL)
VULTACS* (ALKYL PHENOL SULFIDES)
PENTALENES* (AMYL NAPHTHALENES)

AMYLAMINE
DIAMYLAMINE
TRIAMYLAMINE
ETHYLAMINE
DIETHYLAMINE
TRIETHYLAMINE
BUTYLAMINE
DIBUTYLAMINE
TRIBUTYLAMINE

DIETHYLAMINOETHANOL
ETHYL MONOETHANOLAMINE
ETHYL DIETHANOLAMINE
MIXED ETHYL ETHANOLAMINES
DIBUTYLAMINOETHANOL
BUTYL MONOETHANOLAMINE
BUTYL DIETHANOLAMINE
MIXED BUTYL ETHANOLAMINES

TETRAETHYLTHIURAM DISULFIDE
TETRAETHYLTHIURAM MONOSULFIDE
TETRAMETHYLTHIURAM DISULFIDE
ZINC DIETHYLDITHIOCARBAMATE
ZINC DIMETHYLDITHIOCARBAMATE
ZINC DIBUTYLDITHIOCARBAMATE
CUPRIC DIETHYLDITHIOCARBAMATE
SELENIUM DIETHYLDITHIOCARBAMATE

AMYL CHLORIDES
DICHLORO PENTANES
o-AMYL PHENOL
DIAMYL PHENOL
MIXED AMYLENES
AMYL SULFIDE
DIAMYLPHENOXY ETHANOL

* Trademark Registered

SHARPLES CHEMICALS INC.

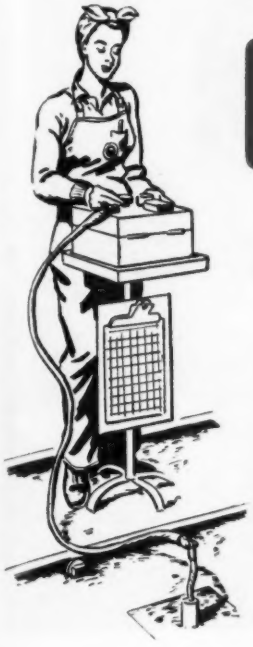
EXECUTIVE OFFICES: PHILADELPHIA, PA.
PLANT: WYANDOTTE, MICH.

Sales Offices

New York Chicago Salt Lake City
West Coast: MARTIN, HOYT & MILNE, INC., Los Angeles . . San Francisco . . Seattle

Number 10 of a Series: **"Looking at the 5 essential things you never see in anodes!"**

Unforgettable EXPERIENCES!



ADDED TOGETHER, the working years of a faithful group of 369 National Carbon Company employees exceed 70 *centuries* of unforgettable experiences! *And unforgotten manufacturing experience* . . . with "Acheson" anodes for the Nation's electrolytic cells. These loyal workers have been associated with us from 15 to 35 years each.

Now in its 60th year, National Carbon looks at the record of this group and of the many hundred others who have contributed so much to its history.

Some have improved plant machinery, or perfected its use. Others have developed new formulas to reduce anode usage costs, or to lower average voltage. Still others have helped customers use anodes more effectively, or have made suggestions to increase electrolytic production of caustic soda, chlorine, chlorates, and other indispensable materials.

We truly believe that this unmatched manufacturing experience, extending over six decades, is of utmost importance to the quality of electrolytic-cell anodes . . . one of "the five essential things you never see" in them but which are basic to our products. The other "unseen" essentials are: Selection of raw materials, manufacturing control, customer service, and continuing research. Your inquiries are cordially invited through our nearest Division Office.

ACHESON GRAPHITE

The registered trade-mark "Acheson" and the "Acheson" Seal distinguish products of National Carbon Company, Inc.

NATIONAL CARBON COMPANY, INC.
Unit of Union Carbide and Carbon Corporation
UCC
GENERAL OFFICES: 30 East 42nd Street, New York 17, N. Y.
DIVISION SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco
In Canada: Canadian National Carbon Company Limited, Toronto 4, Canada

KEEP YOUR EYE ON THE INFANTRY . . . THE DOUGHBOY DOES IT!

Avoid Moisture Damage in Over-Seas Packages

Simply put a few small bags of Jay Cee Silica Gel, like the ones above, inside your container . . . wrap or seal tightly . . . and ship over-seas without fear of damage from "in-the-package" moisture. Jay Cee Silica Gel is an ideal drying agent . . . has amazing power to absorb atmospheric moisture. Thus the air inside of containers is kept absolutely dry and delicate metal parts are protected from rust and corrosion.

Jay Cee Silica Gel is also used in packages of foods, fabrics, chemicals, and other products. Moreover, it has wide application in the air conditioning, refrigeration, and chemical industries. Jay Cee Silica Gel is clear white; passes a rigid section test; meets exacting Government specifications; is strictly a quality product.

JOBBERS WANTED — There are excellent opportunities for jobbers to build profitable business on Jay Cee Silica Gel in a few territories. Write for details.

JOLIET CHEMICALS, LTD., INDUSTRY AVENUE, JOLIET, ILLINOIS

JAY CEE

SILICA GEL

A superior dehydrant

NEW CHEMICALS FROM DU PONT

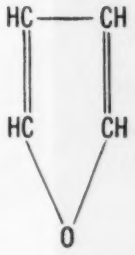
FURAN
TETRAHYDROFURAN
1,4-DICHLOROBUTANE

FURAN

PHYSICAL PROPERTIES

Molecular Weight 68.03
Boiling Point . 32.1°C. at 760 mm.
Sp. G. $\frac{20°C.}{4°C.}$ 0.937
Flash Point . . . . . Below 32°F.

Insoluble in water; readily soluble in most organic solvents.



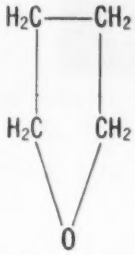
FURAN . . . is a highly volatile colorless liquid. It should be of great value as an intermediate in organic syntheses. With its conjugated unsaturation, furan has reaction characteristics somewhat similar to those of divinyl ether and of butadiene, but modified by its cyclic structure. Because of this modification, substitution or addition reactions can be effected depending on conditions employed. It can be chlorinated, oxidized, hydrogenated, nitrated, metallated, condensed with certain unsaturated compounds and reacted with hydrogen sulfide, ammonia, amines and mercaptans.

TETRAHYDROFURAN

PHYSICAL PROPERTIES

Molecular Weight 72.05
Boiling Point . 66°C. at 760 mm.
Sp. G. $\frac{20°C.}{4°C.}$ 0.888
Flash Point . . . . . Below 80°F.

Very soluble in water and in most common organic solvents.



TETRAHYDROFURAN OR TETRAMETHYLENE OXIDE . . . is a colorless liquid with a strong ether-like odor. It possesses outstanding solvent properties, dissolving many types of resins, both natural and synthetic.

Chemical reactions of this compound are those of an aliphatic ether modified by its cyclic nature. Among these reactions are dehydration to butadiene, oxidation to maleic acid, conversion to halohydrins or dihalides, and reaction with ammonia to form pyrrolidine or with hydrogen sulphide to yield tetrahydrothiophene. Reaction with primary alkyl and aryl amines yields N-alkyl and N-aryl substituted pyrrolidines. Tetrahydrofuran can also be chlorinated, yielding compounds of interest as intermediates in synthesizing other materials.

1,4-DICHLOROBUTANE

$Cl \cdot CH_2 \cdot CH_2 \cdot CH_2 \cdot CH_2 \cdot Cl$

PHYSICAL PROPERTIES

Molecular Weight 126.96
Boiling Point . . . . . 155°C. at 760 mm.
Sp. G. $\frac{20°C.}{4°C.}$ 1.141
Flash Point . . . . . 140°F.

1,4-DICHLOROBUTANE . . . TETRAMETHYLENE CHLORIDE . . . is a colorless mobile liquid with a pleasant odor. The chlorine atoms of this compound are highly reactive, and one or both may be replaced by sulphur, cyanogen, amine, alkoxy, aryloxy and other groups. Its diversity of reactions should make it an exceptionally valuable intermediate in organic syntheses.

AVAILABILITY... Limited quantities of these products are available for research and development. A request on your company letterhead will bring further technical information and also a sample if desired. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Field Research Section, Wilmington 98, Delaware.

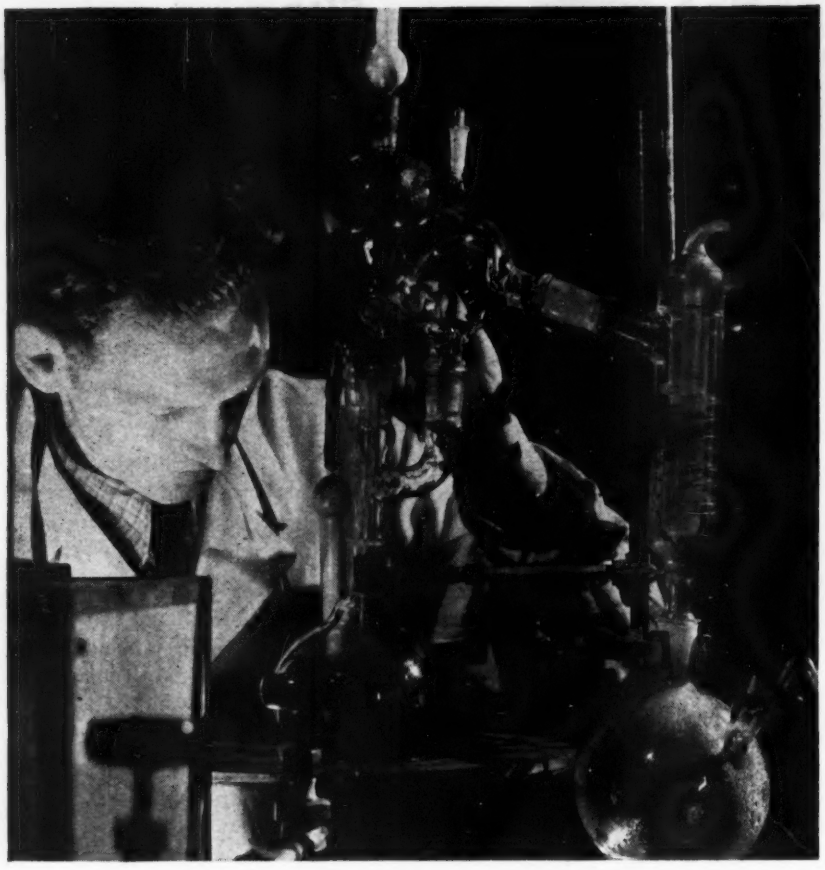
SPEED VICTORY—BUY BONDS!

DU PONT ELECTROCHEMICALS

FIELD RESEARCH SECTION

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY



PURE Vitamins

—products of Merck Research

Merck research has been directly responsible for many important contributions to the synthesis, development, and large-scale production of individual vitamin factors in pure form.

In a number of instances, the pure vitamins may be considered to be products of Merck research. Several were originally synthesized in the Merck Research Laboratories, and others have been synthesized by Merck chemists and collaborators in associated laboratories.

Because most of the known vitamins have now been made available in pure form, effective therapy of specific vitamin deficiencies can be conducted on a rational and controlled basis, under the direction of the physician.

MERCK contributions

1934—Ascorbic Acid Merck was made available by Merck & Co., Inc.

1936—Crystalline Vitamin B_1 was synthesized in the Merck Research Laboratories.

1937—Vitamin B_1 (Thiamine Hydrochloride Merck) was made commercially available.

1938—Nicotinic Acid Merck (Niacin) and Nicotinamide Merck (Niacinamide) were made available.

1938—Riboflavin Merck was the second pure crystalline vitamin to reach production during that year.

1938—Alpha-Tocopherol (Vitamin E) was identified and synthesized by Merck chemists and their collaborators in other laboratories.

1939—Crystalline Vitamin B_6 was synthesized in the Merck Research Laboratories.

1940—Vitamin B_6 Hydrochloride Merck (Pyridoxine Hydrochloride) became available.

1940—Alpha-Tocopherol Merck (Vitamin E) was made commercially available.

1940—Vitamin K_1 Merck (2-Methyl-3-Phytyl-1, 4-Naphthoquinone) was made available.

1940—Menadione Merck (2-Methyl-1, 4-Naphthoquinone), a pure compound having marked Vitamin K activity, became available.

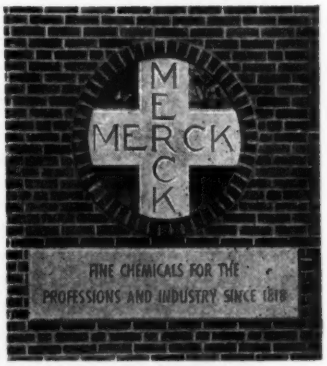
1940—Crystalline Pantothenic Acid, member of the Vitamin B Complex, was identified and synthesized by Merck chemists and their collaborators in other laboratories.

1940—The Calcium Salt of Dextrorotatory Pantothenic Acid was made available by Merck & Co., Inc.

1943—Crystalline Biotin, member of the Vitamin B-Complex, was synthesized in the Merck Research Laboratories.

1944—Biotin Merck was made available by Merck & Co., Inc.

Merck & Co., Inc. now manufactures all the vitamins commercially available in pure form, with the exception of vitamins A and D.



You are invited to write for literature

MERCK & CO., Inc. *Manufacturing Chemists* RAHWAY, N. J.

GLASS PIPE

IS *smooth* INSIDE AND OUT

COMPARE the unretouched photomicrographs above. They tell the story . . . the important story . . . of the relative surface smoothness of PYREX Pipe as compared to corrosion resistant metal alloy pipe. And, PYREX Brand Glass Pipe stays smooth.

The hard, smooth surface of PYREX Pipe resists scratching and abrasion. Its high chemical resistance minimizes or eliminates pitting and scaling due to corrosion.

In your pipe lines, this smoothness is a feature that insures a smooth, even product flow throughout the service life of the pipe. Pipe line friction and turbulence are lessened. There are no rough edges or deep crevices to catch and hold dirt or scale. Combined with the thermal resistance of PYREX Brand Glass, it makes cleaning easier and surer. Pipe lines can be flushed visibly clean in a few minutes time with steam or hot water.

In addition, because of the transparency of PYREX Pipe, you can easily check for these conditions at any time or at any stage of processing.

For more information on any of these features of PYREX Pipe or on its application in your processing operations, write today to the Industrial Sales Department CI-8,

CORNING GLASS WORKS
CORNING, NEW YORK

GLASS PIPE

AND INDICATES MANUFACTURE BY CORNING GLASS WORKS, CORNING, NEW YORK

Pharmaceutical Frontiers

A manufacturing chemist was an American rarity in 1849. Imports were the rule.

While huge Western areas were becoming territories . . . while territories were becoming states . . . while the covered wagon and the iron horse were gradually conquering geographical frontiers, the scope of American chemical production widened.

Two aims accompanied the launching of Chas. Pfizer & Company in business during the famous Gold Rush year. The first: to produce chemicals of the highest quality. The second: to produce in the United States those chemicals which up to then had had to be obtained from overseas.

Within a few years of Pfizer's founding, American physicians and pharmacists realized that here was a reliable source of materia medica . . . of bismuths, iodides and mercurials. After a little more than a decade Pfizer cream of tartar and tartaric acid appeared to challenge the supremacy of wine-making France and Italy.

From 'forty-nine in one century to 'forty-five in another, countless new Pfizer products have been developed to meet ever-expanding pharmaceutical and industrial requirements. Citric acid, long made from imported lemon juice and lime juice concentrates was produced at far lower cost from sucrose, marking a growing trend toward Pfizer leadership in fermentation chemicals.

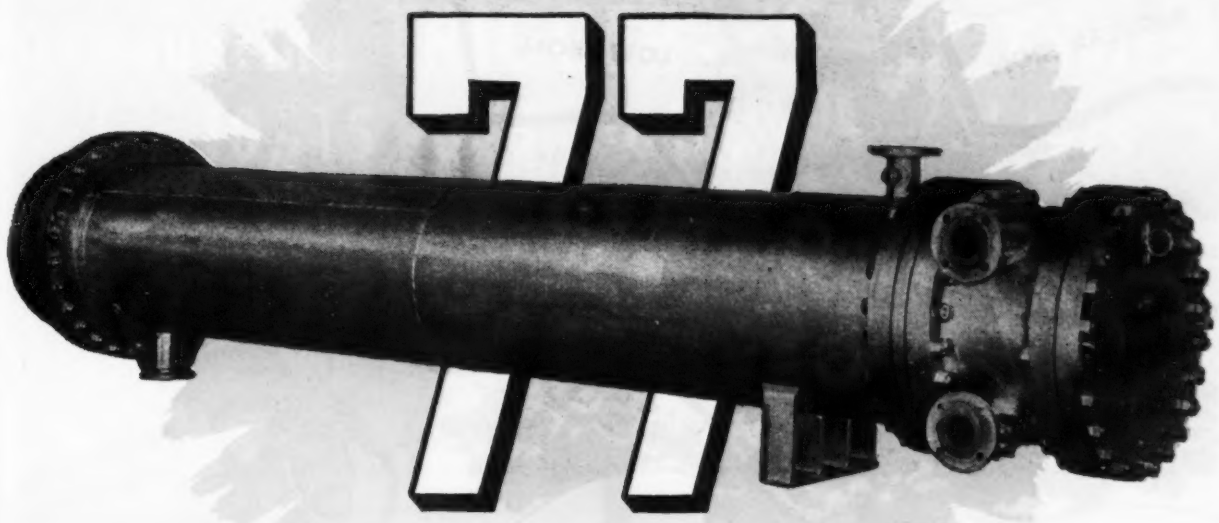
Keeping pace with the uninterrupted advance of American pharmaceutical frontiers, such vitamin preparation ingredients as ascorbic acid and riboflavin have evolved from Pfizer research laboratory techniques. Climaxing the unfolding of a new science of biological engineering has been the controlled output of penicillin in such huge quantities as to make Pfizer the world's largest producer of the astonishing antibiotic which has so revolutionized man's unceasing warfare on disease-bearing bacteria. Chas. Pfizer & Co., Inc., 81 Maiden Lane, New York 7, N. Y.; 444 West Grand Avenue, Chicago 10, Ill.

PFIZER QUALITY

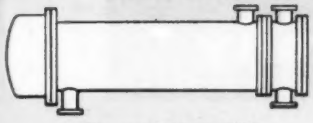
PFIZER

Manufacturing Chemists Since 1849

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS



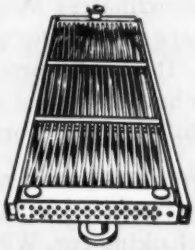
ONLY G-R BUILDS THIS WIDE VARIETY OF HEAT TRANSFER APPARATUS



SHELL and BARE TUBE
Heaters, Coolers, Condensers, Heat Exchangers

G-FIN
Longitudinal-finned elements for greater heat conductivity

K-FIN
Helical-finned elements for vapors and gases



BENTUBE SECTIONS
with scale-shedding elements for hard or salt water

TUBEFLO SECTIONS
Non-clogging design for residuum and other dirty fluids

YEARS OF EXPERIENCE

behind the design of G-R Shell-and-Tube Heat Exchangers

Merely a bundle of tubes in a shell? There's far more than that in an efficient, trouble-free, durable G-R Shell-and-Tube heat exchanger.

When you purchase a G-R unit, you are sure of conservative ratings, with efficient design and sturdy construction that come only from lengthy experience. You also obtain exclusive features that come only from continued pioneering in the development of improvements in heat transfer apparatus. And in addition, G-R Sales Engineers are qualified to give you prompt and authoritative advice, based on their own engineering background and practical field experience.

G-R Shell-and-Tube units, based on the results obtained in many tens of thousands of installations, meet every modern requirement of heat transfer services in petroleum refineries, chemical process, and general industrial plants. For complete description of the design, construction, and applications of these units, write for our Bulletin 915.

THE GRISCOM-RUSSELL CO.
285 Madison Ave., New York 17, N. Y.

GRISCOM-RUSSELL
Pioneers in Heat Transfer Apparatus

With special types for a wide variety of adsorption and catalytic processes

THE versatility of Porocel as a catalyst, adsorbent and catalyst carrier is greatly increased by the special properties of its many grades. These are designed to produce better results with particular materials and under specific conditions. They fall into three general groups:

1 IRON CONTENT. The presence of iron is helpful in some processes, detrimental in others. So there is Regular Iron Porocel with an iron content of 7 to 12%, and Low Iron Porocel with not more than 5%.

2 SIZE. Relatively viscous lubricating oil requires small granules, vapor phase operation a coarser size. Porocel is offered in any mesh from 4/8 to 30/80 in the Regular Iron and from 4/8 to 12/20 in the Low Iron Grade. And there's also minus 60 mesh Porocel "fines."

3 THERMAL TREATMENT. Porosity, surface area and other qualities affecting activity vary with calcination and thermal treatment. The degree of treatment is shown by residual Volatile Material content, or V. M. Porocel is made in two standard V. M. grades, regular with a V. M. content of 6%, low with 2%. Other grades are possible.

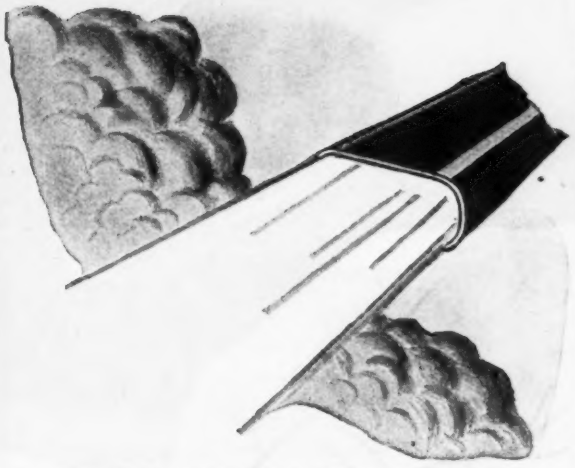
All grades of Porocel offer advantages to refiners and chemists looking for ways to improve their catalytic or adsorption processes. For example, the porosity of Porocel is approximately 50% and its surface area 200 to 250 square meters per gram. Its specific heat is 0.16-0.19. It can be produced with low silica content. The characteristics of all grades are closely controlled to insure uniformity.

New applications for Porocel are continually being discovered. It may be the catalyst, adsorbent, or catalyst carrier you're looking for. Why not try it? We'll be glad to send a generous sample. Just write Attapulgus Clay Company (Sales Agent), 260 South Broad Street, Philadelphia 1, Pennsylvania.

POROCEL CORPORATION • BAUXITE ADSORBENTS AND CATALYSTS

Announcing TRIGGER-FINGER Control for 10, 15, and 20-lb. fire-fighters

AT THE PULL OF A SINGLE FINGER... the new valve on these larger sizes of Kidde portable extinguishers opens with the same ease that has long been a popular feature of the 2- and 4-pound sizes.



THE FULL FIRE-FIGHTING FORCE . . . of the carbon dioxide discharge goes into action at once—no half-way measures with this new valve. When trigger is released, shut-off is complete and instantaneous.

And here are the PLUS features of this Revolutionary Development

1. Lock-open control is simple and sure. A slight forward movement of the trigger finger latches trigger open—no danger of fouling.

2. No replacement parts are needed for recharging.

3. Hydrostatic testing can be carried out without devalving. No devalving for repairs either.

4. Recoil outlet is of improved design.

5. Balanced handle design and low center of gravity make it easier to carry these bigger sizes of extinguishers.

6. Intermittent or continuous control is provided for.

7. The locking pin *cannot jam.* It seats in blind holes — there are no projecting ends to get bent over.

8. Streamlined design improves appearance.

9. Seal wire is fully visible for quick inspection.

10. Valve design is simple, fool-proof. The natural way's the right way to operate it—even a novice can't make a mistake!

10-, 15- and 20-pound extinguishers equipped with this new valve will be ready for delivery October 1. Place your order now.

The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

Walter Kidde & Company, Inc. • 140 Cedar Street • New York 6, N. Y.

Midwest Distributor?. . . . Simple

If you're seeking mid-western distribution for your products, G. S. Robins & Company is the answer. Since 1923 we have served Industry in this area . . . supplying chemicals made by America's leading manufacturers and providing expert technical assistance. Because of this constant contact with all industries we are well apprised of their production problems . . . are able to recommend and sell a wide diversity of products. Hence we are well equipped to present and sell yours. For additional information on our Company and its facilities, write for the G. S. Robins Brochure.

To obtain a copy of PRESENTING G. S. ROBINS & COMPANY merely drop a note to G. S. Robins, Dept. C-8, 126 Chouteau Ave., St. Louis 2, Mo.

G. S. Robins & Company

126 CHOUTEAU AVE.
ST. LOUIS 2, MISSOURI

WORLD'S LARGEST PRODUCER OF SYNTHETIC RESINS

RCI

for the toughest tasks

on the seven seas

NO. 1001
NO. 3011

SUPER-BECKACITES

PURE PHENOLIC OIL-REACTIVE RESINS

At sea, or on land—wherever water resistance is a primary requisite—surface coatings formulated with RCI Super-Beckacites are winning high praise today, as for years past. Both No. 1001 and No. 3011 are notable for imparting exceptional water and weather resistance to exterior Marine finishes—and No. 3011 meets all requirements of Navy Specification No. 52-R-11. For details write the Sales Department at Detroit.

Saturday Evenings at 8:30 (E.W.T.)
You Will Enjoy RCI's
"Symphony of the Americas"
Via Mutual Network Stations

ARMY E NAVY

REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20, Michigan

Other Plants: Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Tuscaloosa, Alabama • Liverpool, England • Sydney, Australia

SYNTHETIC RESINS • CHEMICAL COLORS • INDUSTRIAL PLASTICS • INDUSTRIAL CHEMICALS

CUES AND CLUES

for improved products

CHEMICAL SPIDER WEBS . . .

CONTINUOUS RESEARCH under the impetus of war has made rayon fibers better each year—twice as strong today as five years ago. Rayon fibers and yarns can now be spun far finer than ever before, bringing sheerer, softer fabrics, and longer-lasting wearing apparel.

The basic raw material, Hercules chemical cotton pulp, is precision-controlled during processing, and can be practically made to order for any purpose.

This rayon today meets many needs outside the fashion field. High tenacity rayon provides tire cords of extraordinary toughness. Paint brush bristles are made of rayon, so are filters used in blood transfusions. It is used to give strength to self-sealing fuel cells. *Coupon brings details on chemical cotton.*

DUCK SAVER . . .

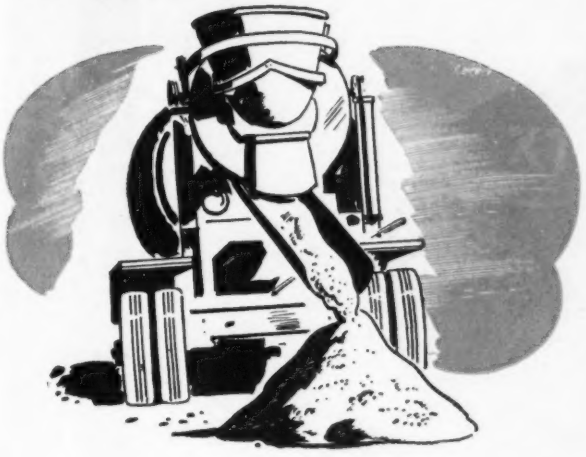
TO RECLAIM the vast quantity of canvas that has seen long military service, new coloring and waterproofing compounds are applied overseas. However, due to shortages of resins used in these compounds, a less critical ingredient had to be found. Coatings based on the usual rosin-base resins were not completely satisfactory.

After considerable research, Hercules is now producing in quantity a new Pentalyn* resin, designed to overcome the disadvantages heretofore inherent in other rosin-based resins when used for this type of coating. Known as Pentalyn* F, this new resin is slated to play an important part in maintaining military equipment. Postwar, it suggests longer life for awnings, canvas-covered furniture, and similar products. *Return coupon for complete details.*

HERCULES

HOW CAN Hercules chemical materials help you make a new and better product, or improve your present ones? What can they do to make your processing more efficient, faster, cheaper? Perhaps the answer lies somewhere within the four examples shown in this edition of CUES AND CLUES! If not, we suggest you write to us fully, stating your problem. Your inquiry on any Hercules material or its potential application will receive immediate attention.

CONCRETE EXTRAORDINARY . . .

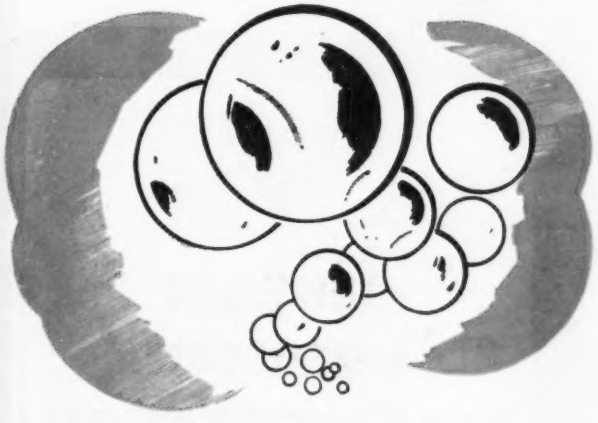


CONCRETE'S greater durability and workability when made from air-entraining Portland cement has long been recognized. With Hercules Vinsol* Resin as the air-entraining agent, there is less separation of water and sand . . . more uniform mixes and final results. Above all, roads and structures made with this modern concrete are virtually immune to the ravages of ice, snow, freezing rain, and thawing sun.

Now, toward even better air-entraining cements, Hercules introduces a new leavening agent—Vinsol NVX. A completely neutralized resin, it saves Portland cement manufacturers time, labor, and money.

Return coupon for detailed information on Vinsol NVX in the manufacture of cement and other construction products.

BUBBLES TO ORDER . . .



FOR SOME USERS of the flotation process, Hercules Dresinates* permit still greater operating efficiency and economy. In the flotation of sulphide minerals, for example, certain of these alkali-metal Dresinates can extend pine oil or cresylic acid frothers up to 15-20%. In addition, better metallurgical results and improvement in froth are obtained.

The Dresinates are also of interest in the flotation of non-metallic minerals such as fluorspar, and in the removal of iron oxide from glass sand. *Return coupon for complete data on these and other Hercules flotation agents.*

*REG. U. S. PAT. OFF. BY HERCULES POWDER COMPANY

SYNTHETICS—TERPENE & ROSIN CHEMICALS
PAPER MAKERS CHEMICALS—EXPLOSIVES
CHEMICAL COTTON—CELLULOSE PRODUCTS

HERCULES POWDER COMPANY
INCORPORATED
992 Delaware Trust Bldg., Wilmington 99, Del.

Please send me further information on:_____

_____

*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

11-54

Traveling Salesman

BY CARRYING YOUR RAW MATERIALS or finished products with speed and economy, General American tank cars help you competitively—open new markets for you—can be considered part of your selling force.

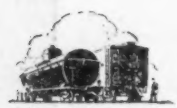
FOR YOUR FUTURE PRODUCTS—perhaps never carried in bulk before—General American research engineers will design the tank cars that give you safe, sure, economical transportation.

GATX GENERAL AMERICAN

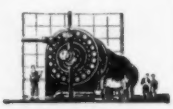
GENERAL AMERICAN TRANSPORTATION

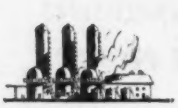
CORPORATION

CHICAGO


Builders and Operators of Specialized Railroad Freight Cars

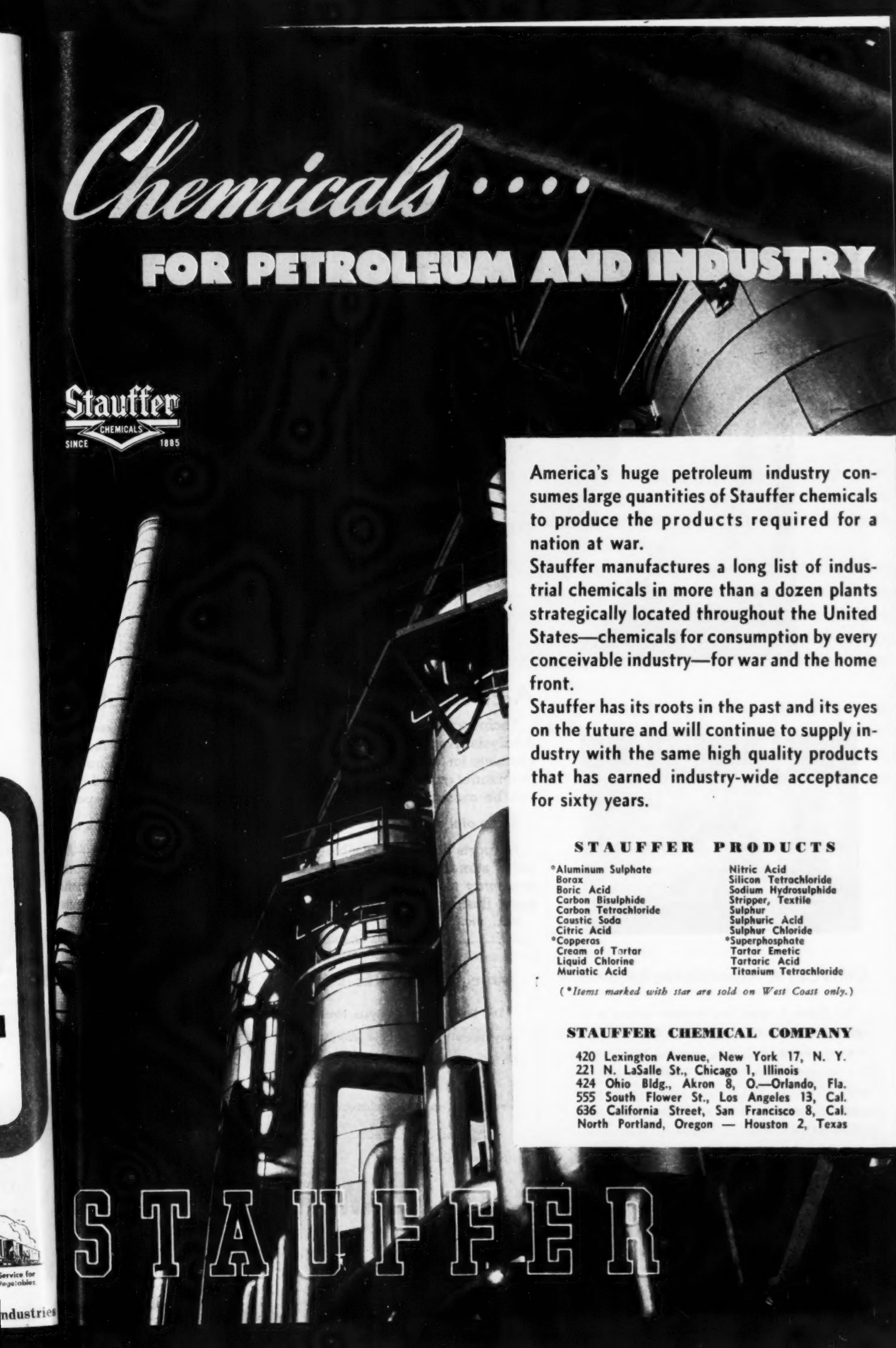
Bulk Liquid Storage Terminals


Process Equipment of All Kinds

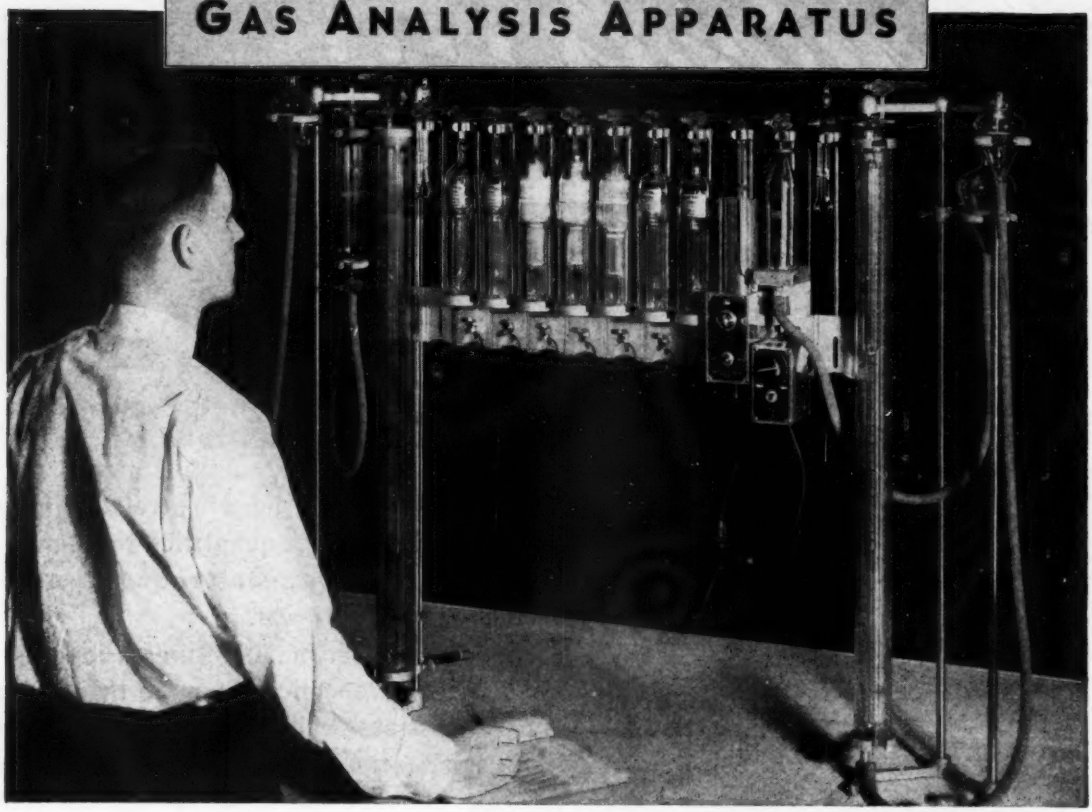

Pressure Vessels and Other Welded Equipment

Aerocoach Motor Coaches

Precooling Service for Fruits and Vegetables


Chemicals....
FOR PETROLEUM AND INDUSTRY
Stauffer
CHEMICALS
SINCE 1885
America's huge petroleum industry consumes large quantities of Stauffer chemicals to produce the products required for a nation at war.
Stauffer manufactures a long list of industrial chemicals in more than a dozen plants strategically located throughout the United States—chemicals for consumption by every conceivable industry—for war and the home front.
Stauffer has its roots in the past and its eyes on the future and will continue to supply industry with the same high quality products that has earned industry-wide acceptance for sixty years.
STAUFFER PRODUCTS
*Aluminum Sulphate
Borax
Boric Acid
Carbon Bisulphide
Carbon Tetrachloride
Caustic Soda
Citric Acid
*Copperas
Cream of Tartar
Liquid Chlorine
Muriatic Acid
Nitric Acid
Silicon Tetrachloride
Sodium Hydrosulphide
Stripper, Textile
Sulphur
Sulphuric Acid
Sulphur Chloride
*Superphosphate
Tartar Emetic
Tartaric Acid
Titanium Tetrachloride
(*Items marked with star are sold on West Coast only.)
STAUFFER CHEMICAL COMPANY
420 Lexington Avenue, New York 17, N. Y.
221 N. LaSalle St., Chicago 1, Illinois
424 Ohio Bldg., Akron 8, O.—Orlando, Fla.
555 South Flower St., Los Angeles 13, Cal.
636 California Street, San Francisco 8, Cal.
North Portland, Oregon — Houston 2, Texas
STAUFFER

FISHER UNITIZED GAS ANALYSIS APPARATUS

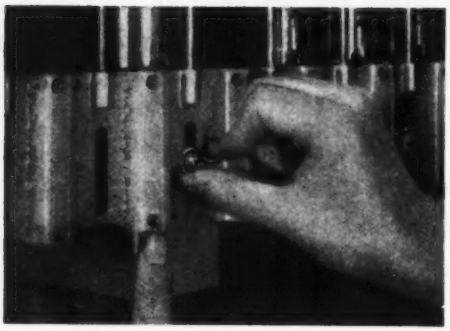


Accuracy — Flexibility — Ease of Manipulation

Technical and precision assemblies of the Fisher Unitized Gas Analysis Apparatus are now generally employed by leading chemists for analyzing flue, blast furnace, producer, coal, natural and tunnel gases also, mine air. Any number of any desired units can be assembled from standardized and interchangeable parts.

Some of the distinctive features of Fisher Unitized Apparatus are:

All parts easily accessible—No fragile one-piece manifold—All parts standardized and interchangeable—Unique straight-bore, three-way stopcocks—Pipettes are Pyrex glass—Manifold permits easy flushing and cleaning—Automatic valve-blubber pipette —etc., etc.



Units Can Be Assembled As Required

The Fisher Unitized Gas Analysis system is as convenient as the Orsat system, as flexible as the Hempel system, and more accurate than either. The different units can be joined together to make a complete and compact apparatus for any particular use; should the need arise, other units can be added or it can be completely reassembled.

Write for this FREE Booklet

The Fisher Gas Analysis Manual, a very useful 64-page book compiled by Dr. M. P. Matuszak, will be sent free of charge to laboratories. It describes various gas analysis techniques.

Manufacturers—Distributors

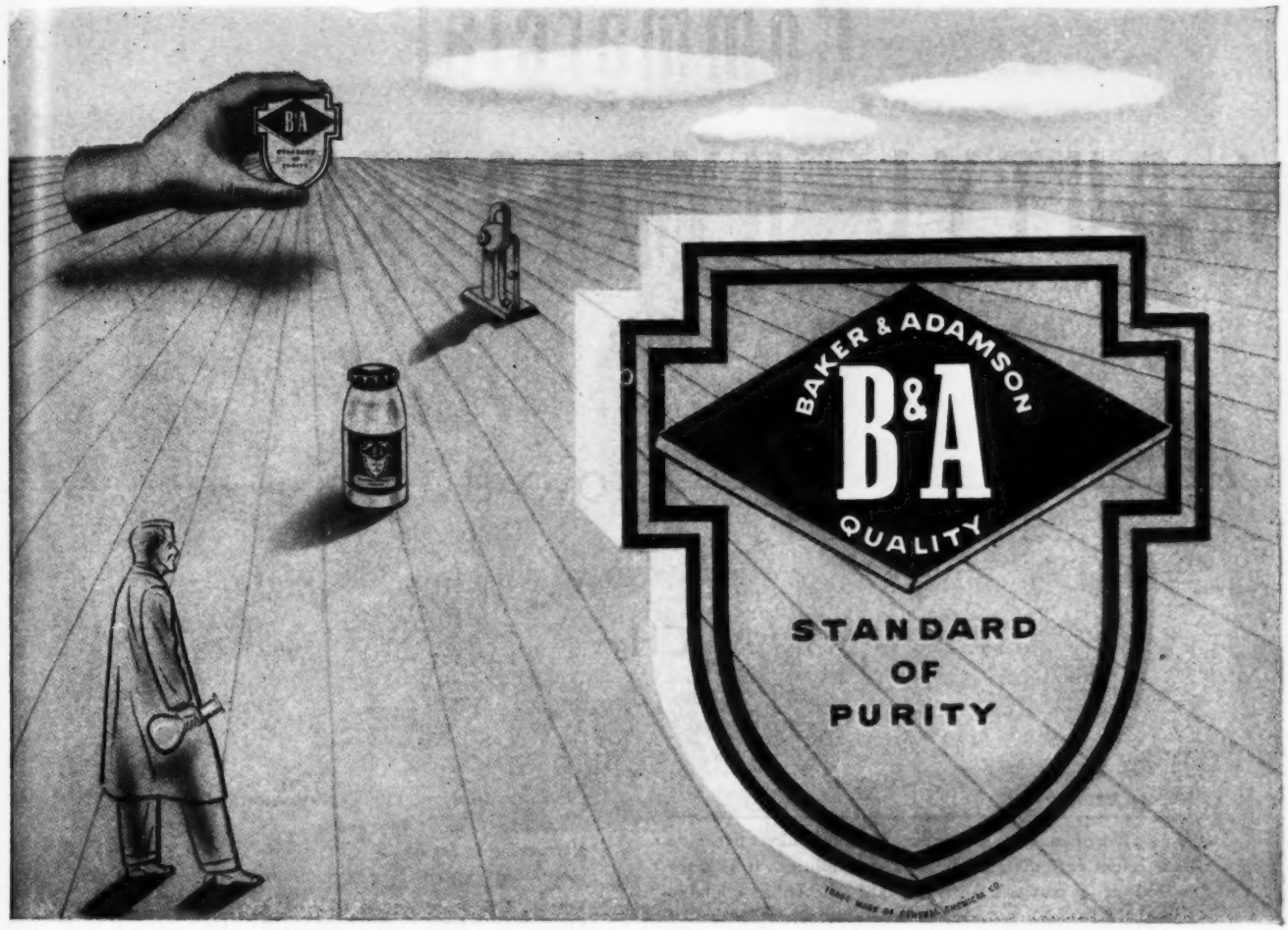
FISHER SCIENTIFIC CO.

717 Forbes St., **Pittsburgh (19), Pa.**
2109 Locust St., **St. Louis (3), Mo.**

EIMER AND AMEND

Greenwich and Morton Streets
New York (14), New York

Headquarters for Laboratory Supplies



WHAT MAKES THIS TRADE-MARK stand out?

IN EVERY INDUSTRY certain trade-marks stand out . . . become accepted standards of quality.

IN THE FIELD OF REAGENT CHEMICALS, the B&A shield has become a recognized symbol for *quality*, *purity* and *reliability* among men who know and use reagent and fine chemicals.

TWO OUTSTANDING FACTORS CONTRIBUTE to this wide-spread acceptance. First, Baker & Adamson always maintains strict manufacturing standards for every product, and its extensive line embraces more than 1,000 quality chemicals! Second, B&A's advanced production techniques and modern control methods are coupled with the "know how" born of 63 years' experience . . . a combination that puts added value into every lot of chemicals!

AS A RESULT, chemists count on B&A . . . rely on the B&A "Standard of Purity." That's why *when quality is a must*—in reagents, fine or "special" chemicals—*specify B&A*. . . . B&A, you will find, is the quality source that counts most!

Setting the Pace in Chemical Purity Since 1882

BAKER & ADAMSON *Reagent and Fine Chemicals*

Division of GENERAL CHEMICAL COMPANY, 40 Rector St., New York 6, N. Y.

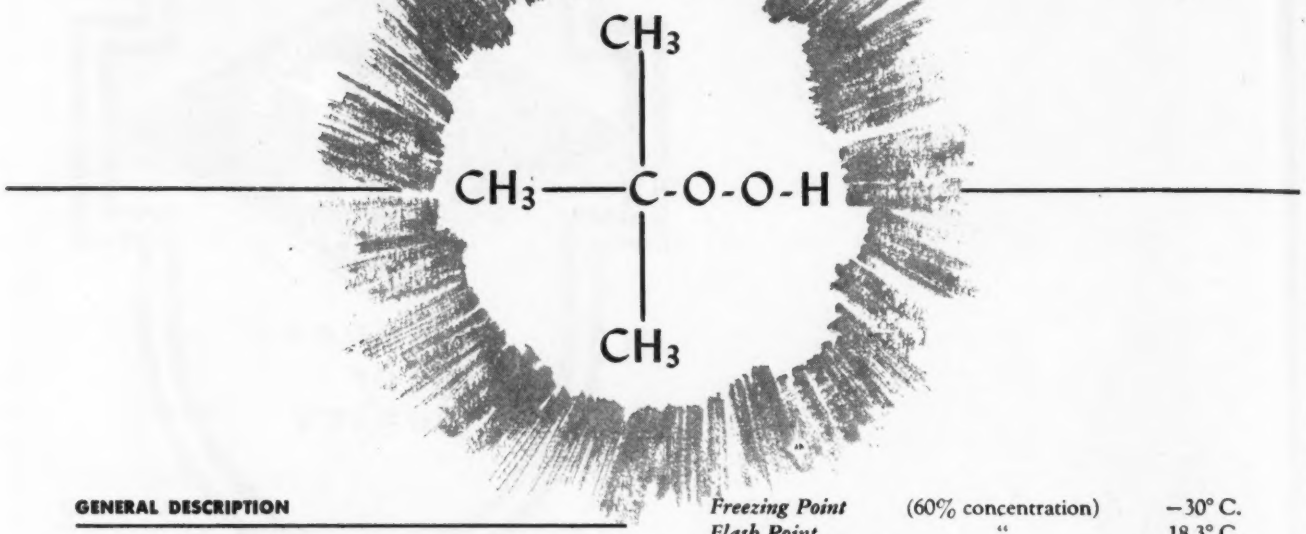
Sales and Technical Service Offices: Atlanta • Baltimore • Boston • Bridgeport (Conn.) • Buffalo • Charlotte (N. C.) • Chicago • Cleveland • Denver • Detroit • Houston • Kansas City • Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Providence (R. I.) • San Francisco • Seattle • St. Louis • Utica (N. Y.) • Wenatchee • Yakima (Wash.)

In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

Commercial

t-BUTYL HYDROPEROXIDE*



GENERAL DESCRIPTION

t-Butyl Hydroperoxide is a new, organic, alkyl peroxide which offers extremely interesting possibilities. It is standardized at a concentration of 60% (10.66% available oxygen). Use of the proper activators increases the rate of release of the oxygen.

SUGGESTED USES

1. As a catalytic agent in one or two phase polymerizations. **(t-Butyl Hydroperoxide has proved to be an excellent catalyst for polymerizing Styrene, as well as certain Elastomers such as Buna S.)**
2. As a drying accelerator in oils, paints, varnishes, etc.
3. As a combustion accelerator for heavy fuel oils used in Diesel engines.
4. As an accelerator in the curing of synthetic resins.
5. As an accelerator in the vulcanization of certain synthetic rubbers.
6. As an oxidation agent for laboratory purposes.

PROPERTIES

Molecular Weight		90
Specific Gravity	@ 25° C. (60% concentration)	0.859
Boiling Point	"	82–83° C.
Freezing Point	(60% concentration)	−30° C.
Flash Point	"	18.3° C.
Refractive Index @ 25° C.	"	1.3960
Available Oxygen	"	10.66%
Color	"	Water White
pH of 1 part 60% Conc. in 10 parts water		4
Stability		Completely stable up to 76.6° C.
Solubility:	60% concentration in water	11%
	Water in 60% concentration	5%
	In short chain aliphatics	Excellent
	In aromatics	Excellent

ACTIVATORS

Hydroquinone and other similar organic reducing agents have proved to be efficient secondary catalysts in polymerization reactions (when used in quantities up to 0.1% of t-Butyl Hydroperoxide), greatly increasing the efficiency of polymerization. When use requires quick release of oxygen, the same proportions of Hydroquinone mentioned above have proved efficient.

• • •

For experimental samples of this interesting new peroxide, write the Union Bay State Chemical Company, Peroxide Division, 50 Harvard St., Cambridge 42, Massachusetts.

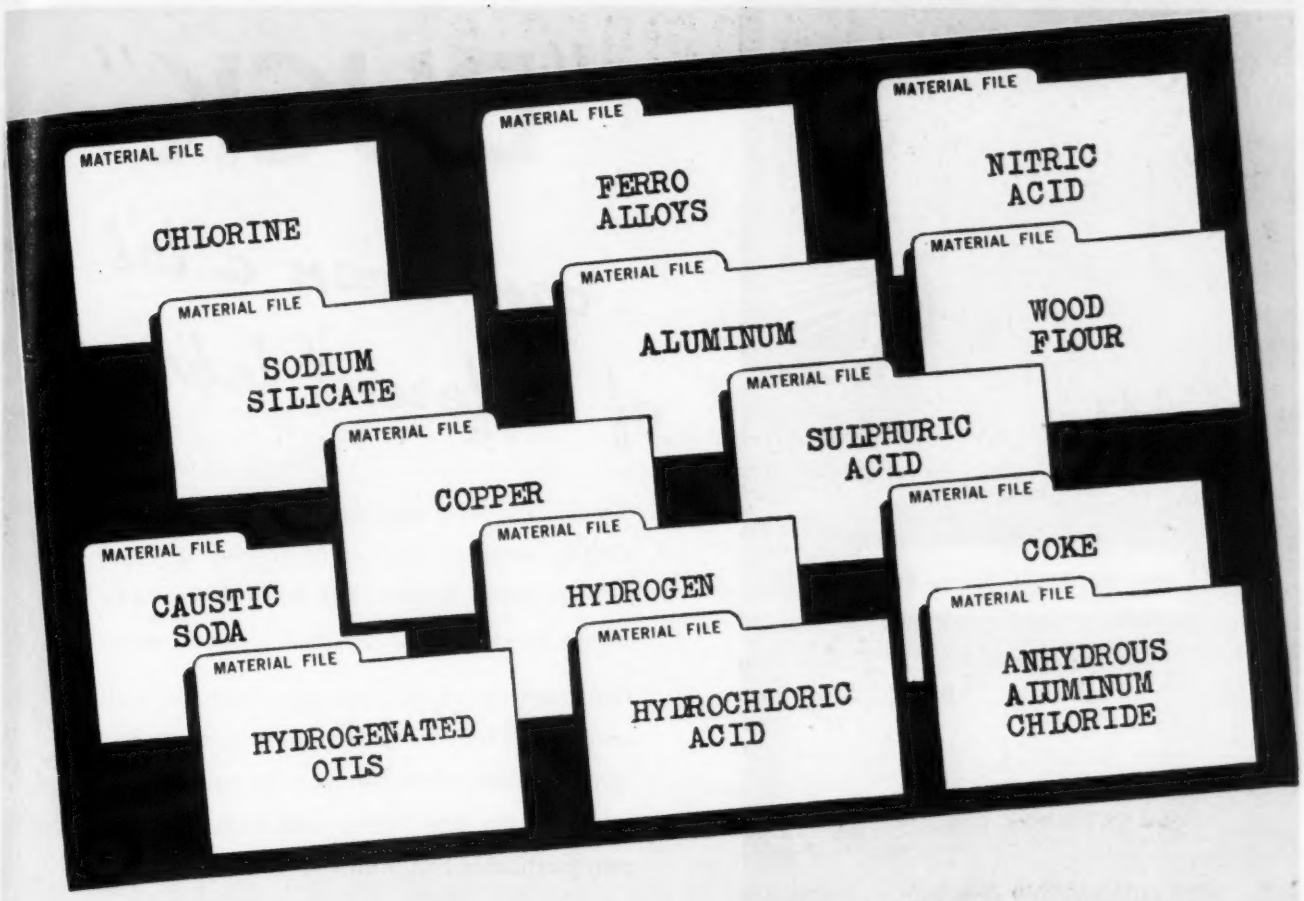
*U.S. PATS. 2176407 & 2223807

UBS

UNION BAY STATE
Chemical Company

Serving Industry with Creative Chemistry

ORGANIC CHEMICALS · SYNTHETIC LATEX · SYNTHETIC RUBBER
PLASTICS · INDUSTRIAL ADHESIVES · DISPERSIONS
COATING COMPOUNDS · IMPREGNATING MATERIALS · COMBINING CEMENTS



All these Basic Processed Materials available to your Plant in *Tacoma!*

Tacoma — Center of the Industry

• Locate in Tacoma, where a score of established plants provide an excellent source of basic processed materials. Metallurgical coke, caustic soda, hydrogen, sodium silicate, chlorine, sulphuric acid, nitric acid, hydrogenated oils, ferro alloys, aluminum, anhydrous aluminum chloride, copper, arsenic, silenium, hydrochloric acid and wood flour — all are produced here. Industrial alcohol is manufactured in a nearby plant.

Raw Materials are Readily Available, too!

• Coking coal — and other coal, ranging from lignite to semi-anthracite — is found in large quantities in the immediate vicinity. Limestone, silica, phosphate rock and salt are readily available. Tacoma's abundant water supply is noted for its chemical purity; the water is offered at low contract rates to larger industrial users.

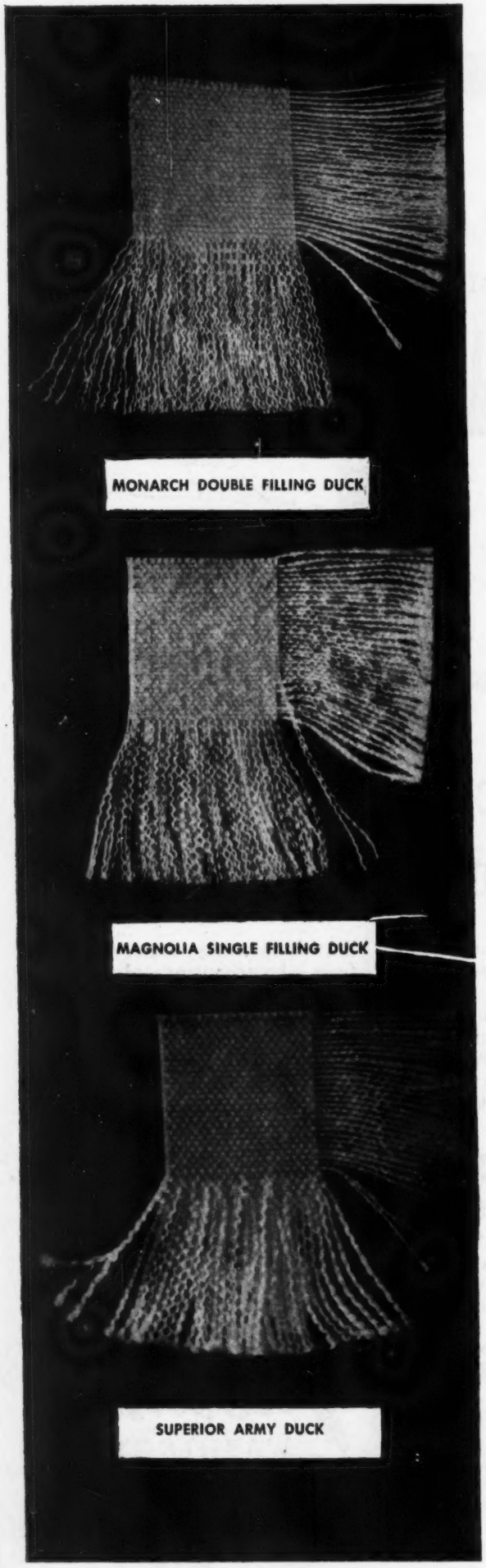
Check Tacoma's Many Other Advantages

• The nation's lowest power rates are offered to industry in Tacoma — and the power supply is huge. Tacoma City Light, Seattle City Light, Grand Coulee and Bonneville are intertied to provide a present capacity of 1,720,000 kilowatts. Additional generators to be installed will increase this capacity to more than 4,000,000 kilowatts. Tacoma has excellent deep-water harbor facilities, is served by four transcontinental railroads, has a municipal "Belt-Line" which provides free switching service on line-haul traffic. Taxes and tax trends are favorable. The climate is ideal for year-round production. There are other advantages, too—and many may be important to your particular operation. Investigate now! Write or wire: The Tacoma Chamber of Commerce, Tacoma 1, Washington.

Locate Your Plant in

Tacoma
WASHINGTON

Home of the Nation's Lowest Power Rates!



"DUCK"

can mean a lot of different fabrics—

"Duck" is a term applied to the many *different* widths, weights and constructions of heavier square-weave fabrics. The three shown here indicate ways in which constructions can vary.

The great range of fabric constructions, widths, weights and finishes normally produced by the mills we represent offers you the opportunity of selecting the one fabric that best meets your own particular requirements.

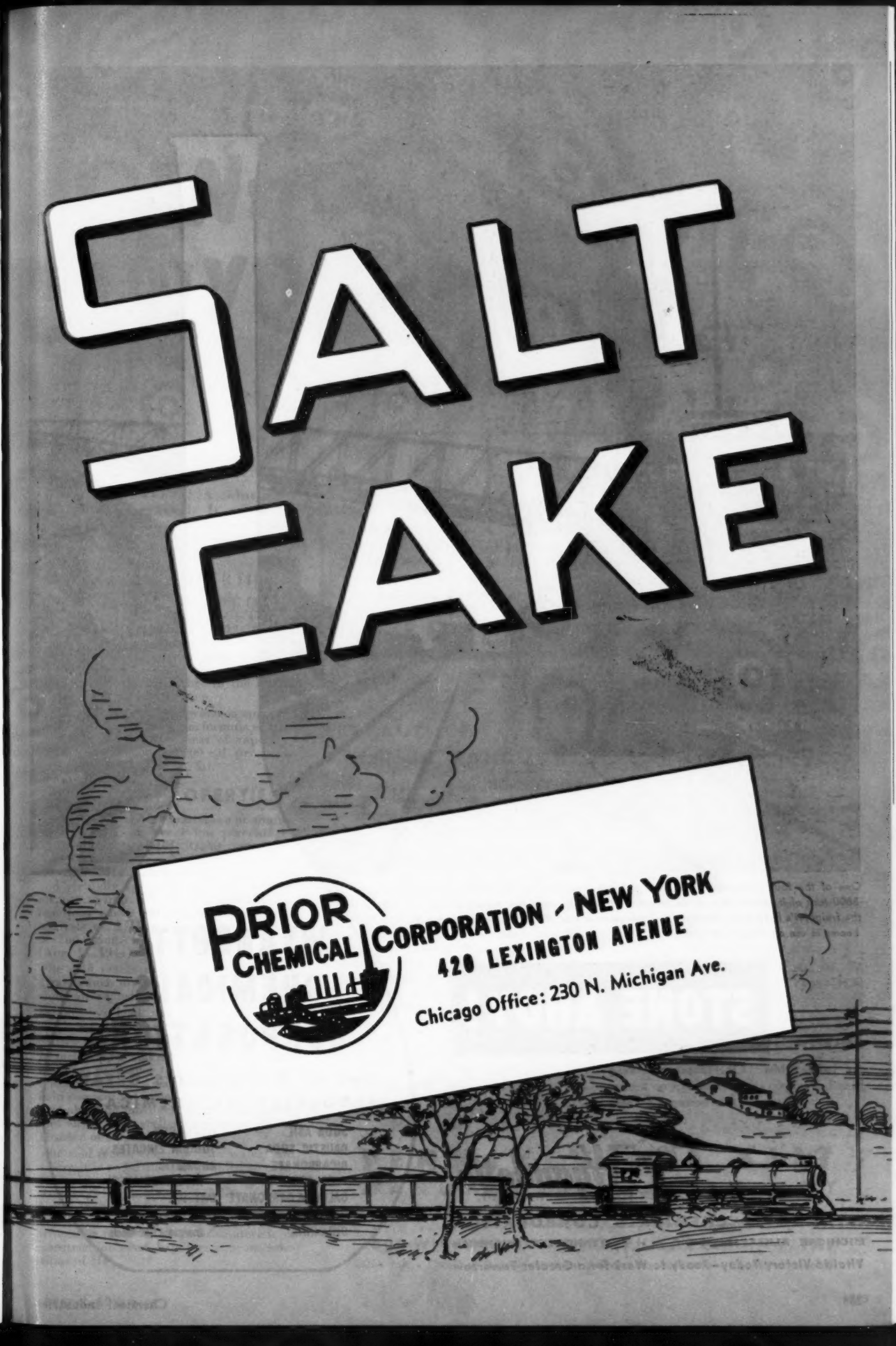
Our textile engineers are available to work with you in developing special constructions for unusual purposes.

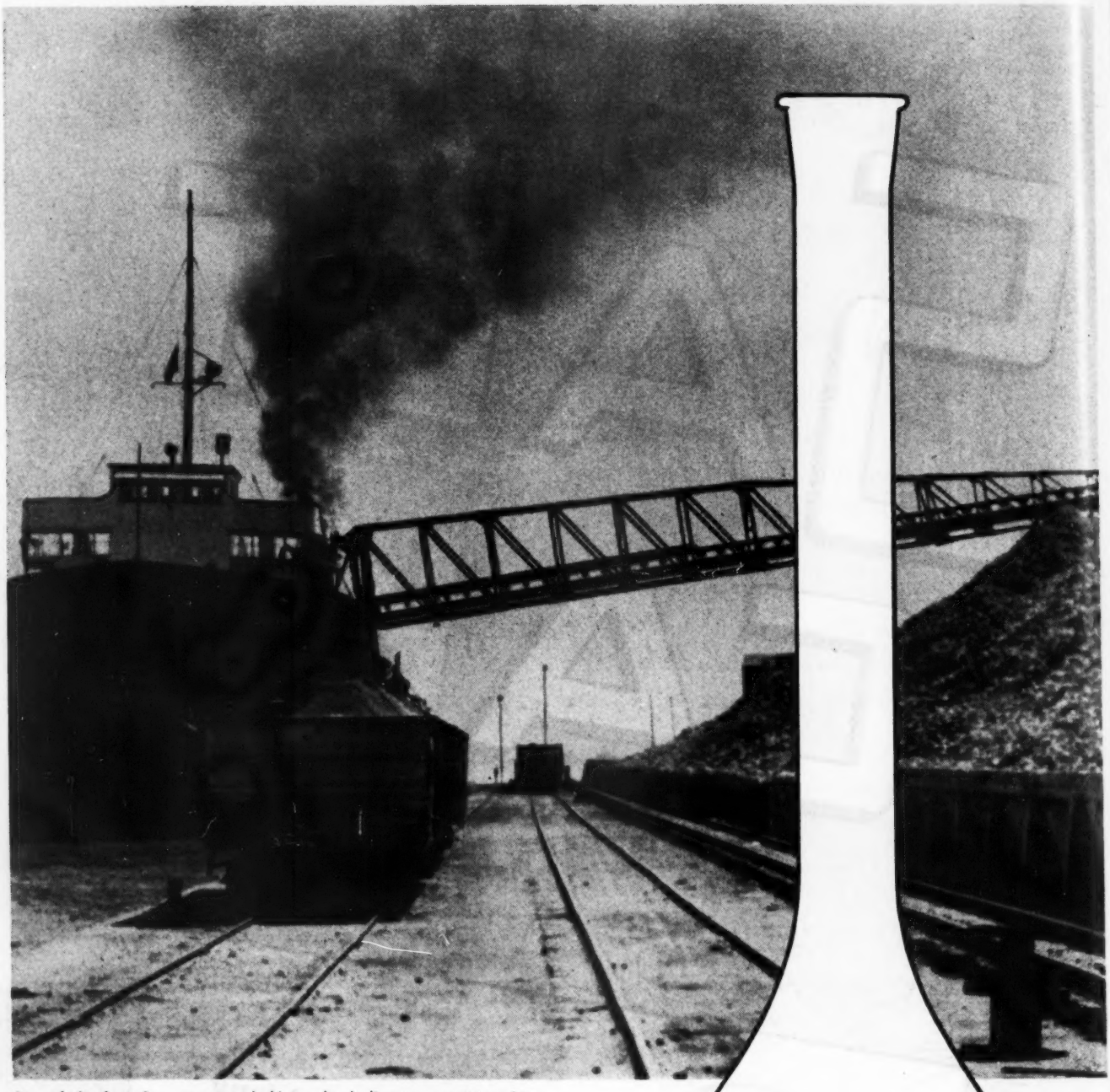
SEND FOR SAMPLE BOOK

These fabric samples for the Plastic Industry represent 12 types of fabric—they have been selected from several thousand fabric constructions made in the 18 mills we represent. In addition to standard constructions, we develop fabrics to specifications.

BUY MORE WAR BONDS

WELLINGTON SEARS CO.
65 WORTH STREET NEW YORK 13, N. Y.


SALT
CAKE
PRIOR
CHEMICAL CORPORATION - NEW YORK
420 LEXINGTON AVENUE
Chicago Office: 230 N. Michigan Ave.



One of the four Company-owned ships unloads limestone at Wyandotte—8800 tons of it in only four to six hours! Endless belts carry the stone from the freighter's hold to an elevator, and thence to one of the largest movable booms in use on the Great Lakes.

STONE AHOY!

Wyandotte
REG. U. S. PAT. OFF.

WYANDOTTE CHEMICALS CORPORATION
MICHIGAN ALKALI DIVISION • WYANDOTTE, MICHIGAN

Vital to Victory Today—Ready to Work for a Greater Tomorrow

WYANDOTTE CHEMICALS CORPORATION

ONE OF THE WORLD'S GREAT PRODUCERS OF CHEMICALS

- SODA ASH
- CAUSTIC SODA
- BICARBONATE OF SODA
- CALCIUM CARBONATE
- CALCIUM CHLORIDE
- CHLORINE
- HYDROGEN
- SODIUM ZINCATES
- AROMATIC INTERMEDIATES
- DRY ICE
- Other Organic and Inorganic Chemicals

ANHYDROUS HYDROFLUORIC ACID

FORMULA: HF

DESCRIPTION: A colorless, corrosive, fuming liquid. It volatilizes easily and on contact with the atmosphere, forms a visible cloud similar in appearance to steam.

PHYSICAL PROPERTIES:

AHF has a sp. gr. of 1.008 at 0°C (32°F); its boiling point is 19.4°C (66.9°F); its freezing point is about -85°C (-121°F). Its viscosity for all practical purposes is comparable to water. It flows freely and can be handled in comparatively small pipe lines. It can be used either in the liquid or gaseous form in reactions.

Its heat of solution with water is approximately 11,600 cal. per gram formula weight (1040 Btu/lb), and its heat of vaporization is approximately 6000 cal. per gram formula weight (540 Btu/lb).

CHEMICAL PROPERTIES:

The commercial AHF contains a minimum of 99.0% HF, and very low percentages of H_2SiF_6, SO_2, and H_2SO_4 as impurities. A very pure acid containing a higher percentage of HF, less than 0.35% of water, and virtually approaching a C.P. acid in respect to impurities is also available for reactions where needed. For methods of analysis of AHF, see analytical edition of Ind. Eng. Chem., Vol. 16, P. 483 (Aug. 15, 1944).

The acid reacts rapidly with silica, and attacks such materials as glass, porcelain, enamelware, asbestos, etc.

In addition, lead, cast iron, wood, rubber and most plastics are attacked and are unsatisfactory for handling the acid.

Monel, copper and mild carbon steel have excellent resistance to the anhydrous acid and are being used successfully in handling it in commercial installations. Platinum is probably the most resistant of all metals and silver has excellent resistance in the absence of sulphides.

The acid reacts violently with water, and where it is to be diluted or added to solutions, installations should be designed so as to guard against the possibility of water being forced or drawn into cylinders or containers of the strong acid. Special attention must be given to materials of construction when handling aqueous solutions of HF.

SOME USES FOR AHF:

AHF is being used in increasingly larger quantities as an alkylation catalyst in the production of high octane gasoline. It is also used in the production of organic fluorine compounds, and in the synthesis of other organic compounds.

It can be diluted to form very pure aqueous HF acid for the preparation of high purity inorganic fluorine compounds.

As suggested by its physical and chemical properties, new uses as a condensation reagent and fluorinating agent are being continually reported. Current work indicates that it is of increasing interest in polymerization, isomerization and acylation reactions.

PRECAUTIONS IN HANDLING:

Anhydrous Hydrofluoric Acid and its water solutions attack the skin and tissues strongly, producing painful burns. Strong concentration of the vapors may cause irritation of the throat, constricted breathing, and possibly inflammation of the lungs. Contact with the acid and vapor should be carefully avoided thru the observance of proper safety precautions, and in cases of accidental contact, approved first aid measures should be promptly followed. For additional information, refer to the Manufacturing Chemists' Assoc. Manual Sheets TC-5 and H-2. Copies of these will be furnished by us on request.

SHIPPING CONTAINERS:

AHF is regulated by ICC as a hazardous article, being classified as a "corrosive liquid." The shipping containers specified by ICC are pressure vessels, as commonly used for compressed gases.

The containers now available from Penn Salt are:

CYLINDERS: Sizes—6 lbs. net, 100 lbs. net, and 230 lbs. net. Type—ICC Specification 3A480.

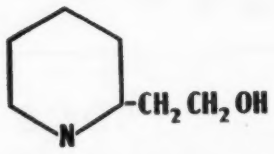
TANK CARS: Sizes—11½ tons net, 22 tons net, and 42 tons net. Type—ICC Specification 105A series.

SHIPPING CLASSIFICATION:

Corrosive liquid—ICC white label required on cylinders. ICC corrosive liquid placard required on tank cars.

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals
1000 WIDENER BUILDING, PHILADELPHIA 7, PA.
New York • Chicago • St. Louis • Pittsburgh • Cincinnati • Minneapolis • Wyandotte • Tacoma

Reilly COAL TAR Chemicals



2-ETHANOLPYRIDINE

PURITY . . . . . (Minimum) 95%

MOLECULAR WEIGHT 123

BOILING POINT: At 10 mm. Hg . . . . . 117°C
At 760 mm. Hg. with decomposition . . . . 235°C

SOLUBILITY: Water . . . . . Miscible
Aliphatic hydrocarbons . . . . . Slight
Aromatic hydrocarbons . . . . . Miscible
Alcohols, ethers, ketones . . . . . Miscible

USES: The manufacture of pharmaceuticals, insecticides, fungicides, rubber accelerators, anti-oxidants, disinfectants, lubricants, and for numerous organic syntheses. The solubility properties of 2-Ethanolpyridine suggest its use as a coupling or blending agent.

APPROXIMATE WT. PER GALLON: 9 lbs.

Reilly COAL TAR PRODUCTS

A Dependable Source OF SUPPLY FOR ALL COAL TAR PRODUCTS

☆ With unusual production and delivery facilities, plants in 17 strategic locations, and offices in major cities, Reilly offers a complete line of coal tar bases, acids, oils, chemicals and intermediates. Booklet describing all these products will be mailed on request.

REILLY TAR & CHEMICAL CORPORATION

2513 S. Damen Ave.
CHICAGO 8, ILLINOIS

Merchants Bank Bldg.
INDIANAPOLIS 4, INDIANA

500 Fifth Ave.
NEW YORK 18, NEW YORK

WHAT ARE YOU DOING TO CUT *Shipping* LOSSES?

Through war experience big improvements have been engineered in packing and protecting shipments to assure undamaged arrival. What has been learned, often under exacting specifications and unusual requirements, can be translated profitably into the needs of commercial material handling — *sometimes at a distinct savings in cost and labor.*

Signode Packing and Shipping Engineers have worked very closely with many leading manufacturers in the improvement of their Shipping Methods. These same well trained and experienced men are now ready to help you.

Remember . . . if utmost economy is to be realized, proper material handling must be planned as an integrated part of production.

HELPFUL FACTS

Guide to Better Shipping explains many practical Steel Strapping applications.

Signode Mechanical Brakeman — an economical and efficient method of carload protection.

WRITE FOR THEM

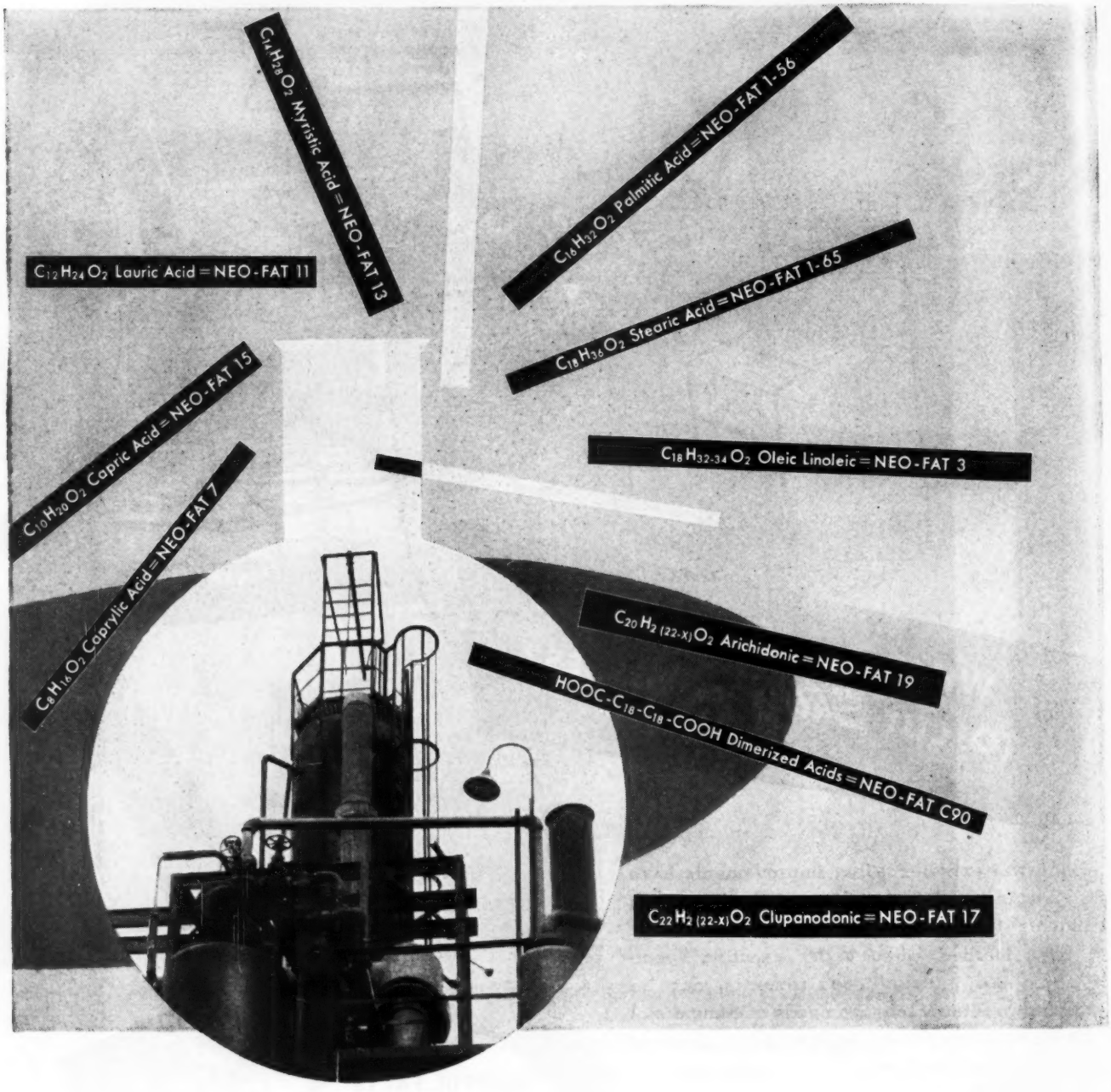
ARMY E NAVY

A second white star, the third citation, has been earned by Signode workers.

SIGNODE
STEEL STRAPPING CO.

SIGNODE

SIGNODE STEEL STRAPPING CO.
2662 N. Western Ave., Chicago 47, Illinois
Brooklyn, N. Y.: 395 Furman Street
San Francisco, Calif.: 481 Bryant Street


$C_{14}H_{28}O_2$ Myristic Acid = NEO-FAT 13
$C_{16}H_{32}O_2$ Palmitic Acid = NEO-FAT 1-56
$C_{12}H_{24}O_2$ Lauric Acid = NEO-FAT 11
$C_{18}H_{36}O_2$ Stearic Acid = NEO-FAT 1-65
$C_{10}H_{20}O_2$ Capric Acid = NEO-FAT 15
$C_{18}H_{32-34}O_2$ Oleic Linoleic = NEO-FAT 3
$C_8H_{16}O_2$ Caprylic Acid = NEO-FAT 7
$C_{20}H_{2(22-X)}O_2$ Arichidonic = NEO-FAT 19
HOOC-C_{18}-C_{18}-COOH Dimerized Acids = NEO-FAT C90
$C_{22}H_{2(22-X)}O_2$ Clupanodonic = NEO-FAT 17

from these **NEO-FATS** *. . . new horizons for industry*

Though many uses may yet be undiscovered, these Neo-Fat Pure Fatty Acids have wide acceptance today in greatly diverse fields . . . in protective coatings . . . in wax compounds . . . in rubber products . . . in alkyd resins . . . in soaps . . . in flotation recovery, to name a few.

In addition we can supply the nitriles, amines, amides, acid chlorides and synthetic oils . . . in the same wide range as the Neo-Fats.

You'll find it worthwhile to consider the Neo-Fats for your products . . . present and future. May we send you details on the entire series?

ARMOUR CHEMICAL DIVISION

ARMOUR AND COMPANY • 1355 WEST 31ST STREET • CHICAGO 9, ILLINOIS

SPEED AND CONTROL COUNT IN YOUR LIME PROCESSES TOO

.. and Marblehead Provides Both!

CHEMICAL ANALYSIS OF MARBLEHEAD CHEMICAL LIME

	LUMP LIME	"CHEMICALLY PURE" HYDRATED LIME
Calcium as Ca (OH_2)		98.20
Calcium as CaO	97.90	74.40
Silica	.43	.40
Iron and Aluminum Oxides	.45	.44
Sulphur	Nil	Nil
Magnesium Oxide	.52	.35
Ignition Loss	.66	24.34

STRICT technical control in mining and refining of Marblehead Chemical Lime assures precise control in your factory or laboratory. Marblehead's unvarying purity speeds up lime-using processes, helps maintain fixed proportions and keeps production on the move.

The analysis shown indicates Marblehead's high calcium content — and note the negligible percentage of impurities present. It's practically all *live chemical energy*, ready to do its job faster, more efficiently, more economically.

Whether you use lime as a chemical reagent or for water softening, there is a Marblehead product to meet your specific requirements. Wherever lime is used, you can rely on Marblehead for uniform high quality and maximum results.

★ **FOUR FORMS** ★

TRY A CAR NOW IN YOUR OWN PLANT

MARBLEHEAD LIME CO.

160 N. LaSalle St. Chicago 1, Ill.

BICHROMATES

for Victory and Peace

•

BICHROMATE OF SODA

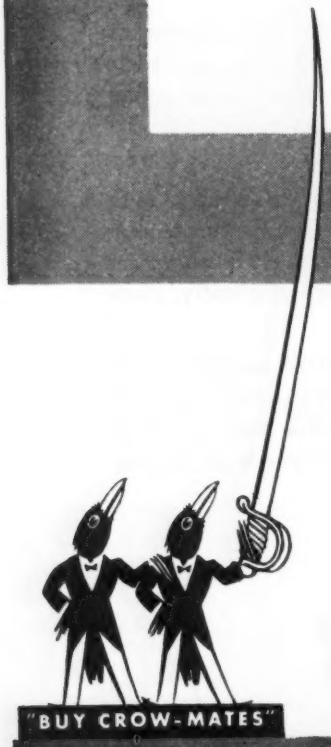
Crystals — Granular

•

BICHROMATE OF POTASH

Crystals — Granular

SOLE MFRS. SINCE 1908
BICHROMATE
Natural
OF SODA
NATURAL PRODUCTS REFINING CO. JERSEY CITY, NEW JERSEY



Throughout the more than 35 years in which we have been serving industry, product purity and uniformity have been our constant watchwords. In the production of Natural Bichromates there has been no compromise with quality - - - and there never will be.

NATURAL PRODUCTS REFINING CO.

904 GARFIELD AVE., JERSEY CITY 5, N. J.

Blueprint for Science

by ROBERT L. TAYLOR, editor

VANNEVAR BUSH'S REPORT TO PRESIDENT TRUMAN on the scientific needs of the nation is an important document. If supporting legislation is introduced and passed, it may be a much more important document to American chemical industry than many now realize, and it should certainly be on the required reading list of all.

The report was prepared at the request of President Roosevelt last fall to answer four questions: (1) what can be done, consistent with military security, to broadcast knowledge of our wartime contributions to science; (2) what can be done to organize a program for continuing in the future the work of medicine and related sciences in the war against disease; (3) what the government can do to aid research activities by public and private organizations, and (4) what effective program can be devised for discovering and developing scientific talent in American youth to keep future scientific research on a level comparable with that of the war period.

In response to these questions, Dr. Bush, supported by a committee of distinguished scientists, educators and industrialists, made the following principal recommendations:

- Government should extend financial support to basic medical research in the medical schools and in universities.
- For more adequate military research in peacetime, a civilian-controlled organization should be set up with close liaison with the Army and Navy, but with funds direct from Congress, and the clear power to initiate military research which will supplement and strengthen that carried on directly under the Army and Navy.
- To provide coordination of the common scientific activities of the various governmental agencies as to policies and budgets, a permanent Science Advisory Board should be created to advise the executive and legislative branches of Government on these matters.
- To promote industrial research, Government should increase the flow of new scientific knowledge through support of basic research in the colleges, universities and research institutes.
- Government should provide a reasonable number of science scholarships and fellowships in order to develop scientific talent in American youth.
- Government should provide incentives to industry to conduct research through clarification of the Internal Revenue Code in regard to the deductibility of research expenditures against income, and by strengthening the patent system so as to eliminate uncertainties and abuses.
- A Board composed of Army, Navy and civilian scientific members shoud be promptly established to release and encourage publication of wartime technical information.
- To carry out this program, a National Research Foundation should be created, composed of persons of broad interest and experience, having an understanding of the peculiarities of scientific research and scientific education. It should have stability of funds. It should recognize that freedom of inquiry must be preserved and should leave internal control of policy, personnel, and the method of scope of research to the institutions in which it is carried on. It should be fully responsible to the President and through him to the Congress for its program.
- Cost of the complete program is estimated at $33,000,000 for the first year, with stabilization at about $122,000,000 per year in the fifth year.

This is a large program. It is the result of long deliberation by some of the nation's top scientists and industrialists, such as, in addition to Dr. Bush, Dr. Linus Pauling of California Tech, Col. Bradley Dewey of Dewey & Almy, Dr. Edwin H. Land of Polaroid Corp., Dr. Robert E. Wilson of Standard Oil of Indiana, Dr. C. Lalor Burdick of duPont, Dr. J. B. Conant of Harvard, and Dr. Karl T. Compton of M. I. T., to name some of those best known to the chemical industry.

The program differs in several fundamental respects from other programs that have been advanced for a national mobilization of scientific research, the best known of which is that proposed in several Congressional bills by Senator H. W. Kilgore, chairman of the War Mobilization Subcommittee of the Senate Military Affairs Committee. In the first place, Dr. Bush is careful throughout his report to distinguish between basic and applied research. Any program that would attempt to control or assume direction over the *application* of scientific knowledge in a competitive

economy would assuredly defeat its own ends, aside from destroying one of the most stimulating and powerful tools of that economy. Dr. Bush recognizes this when he says that "the most important ways in which the Government can promote industrial research are to increase the flow of new scientific knowledge through support of *basic* research, and to aid in the development of scientific talent. . . Basic research is performed without thought of practical ends. . . Industry will fully rise to the challenge of applying new knowledge to new products."

Another point in which the program differs from previous ones is its great stress on the importance of freedom of the investigator. He must be permitted to pursue lines of his own choosing as long as they contribute in some fashion to the sum total of scientific knowledge. This is an element that is extremely difficult of comprehension by those who have not been trained in science. Yet it is perhaps the single most important principle in determining the success of any program designed to increase the scientific stature of the United States. Dr. Bush emphasizes this in his statement of the "five fundamentals" of the program:

1. Whatever the extent of support may be, there must be a stability of funds over a period of years so that long-range programs may be undertaken.

2. The agency to administer such funds should be composed of citizens selected only on the basis of their interest in and capacity to promote the work of the agency. They should be persons of broad interest in and understanding of the peculiarities of scientific research and education.

3. The agency should promote research through contracts or grants to organizations outside the Federal Government. It should not operate any laboratories of its own.

4. Support of basic research in the public and private colleges, universities, and research institutes must leave the internal control of policy, personnel, and the method and scope of the research to the institutions themselves. This is of the utmost importance.

5. While assuring complete independence and freedom for the nature, scope, and methodology of research carried on in the institutions receiving public funds, and while retaining discretion in the allocation of funds among such institutions, the Foundation proposed herein must be responsible to the President and the Congress. Only through such responsibility can we maintain the proper relationship between science and other aspects of a democratic system.

It will be noted that the report stresses the need for care in selection of the persons to administer the program and funds. They should have an "understanding of the peculiarities of scientific research and education." Previous programs have left the way more open for political appointments to the administrative positions. Of course, the possibility of political control is always a risk in any Government-sponsored program, no matter how well conceived. But it is not insurmountable. Evidence of this is to be found in our system of state-supported education. Indeed, in some of its major divisions the Bush proposal represents the extension to national proportions of a system that is already working reasonably well on a state-wide basis. As long as the distinction between basic and applied research is observed, the opportunities for political control and for competition with private industry are minimized.

As far as the military research part of the proposal is concerned there would seem to be no question of its logic or necessity. Military research is properly a function of government, and it must be applied research of the highest order under the most able direction obtainable. This the program should be able to provide.

Dr. Bush is rather obscure in his recommendations on changes in the patent system, limiting his remarks to stating that changes must be made to eliminate abuses. Just what these changes are to be, is of greatest interest to industry. But that phase of the program, he states, will be covered in a separate report and presumably by separate legislation, so it need not necessarily be considered with the rest of the proposal.

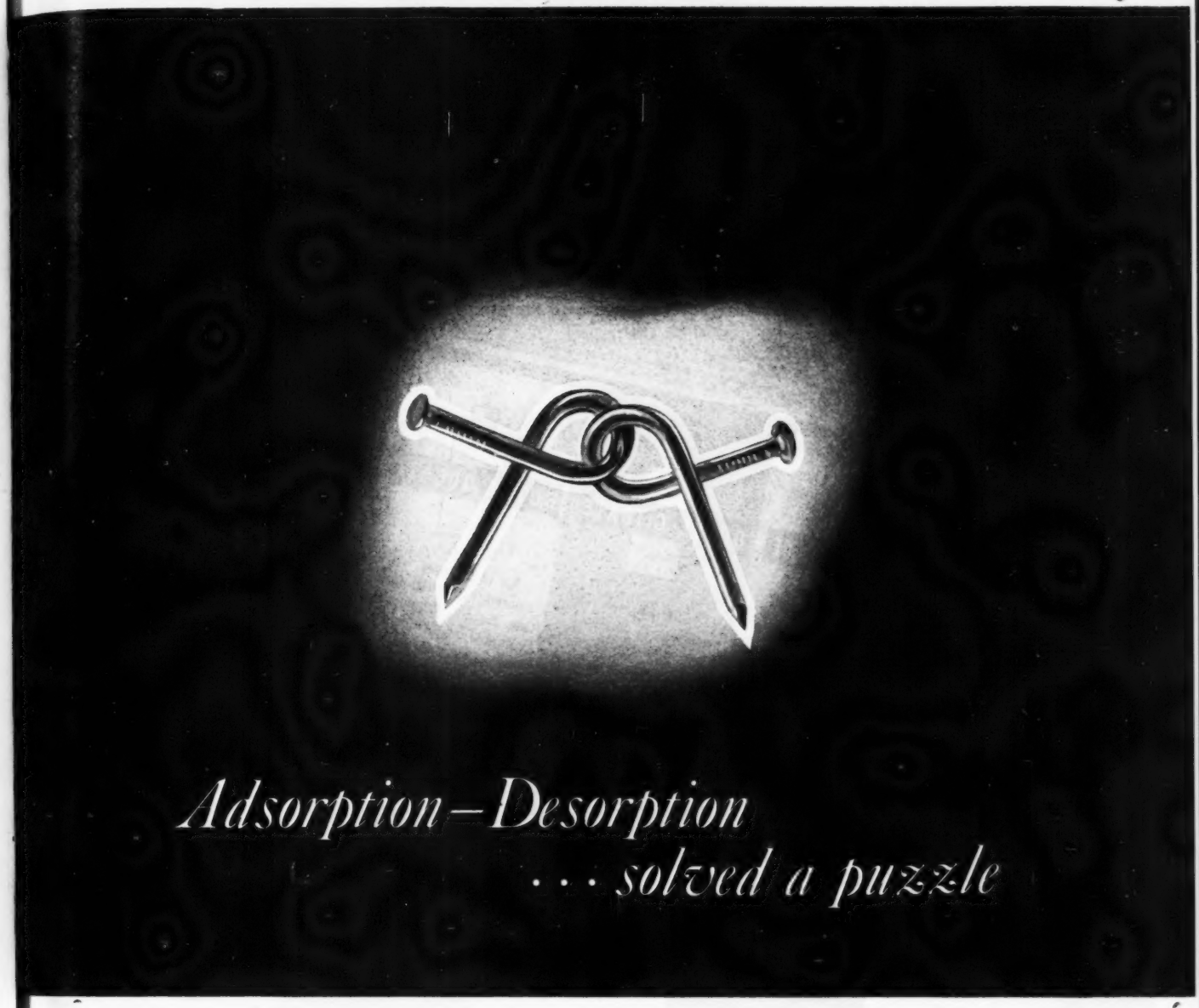
All indications point to intensified programs of development of science and industry in the other great nations of the world. Our own national problems call for development of new industries and new employment. Thus there seems to be a definite place for something, consistent with our basic American system of free enterprise, along the lines that Dr. Bush and his able collaborators propose. The conclusions and recommendations they have presented in their report to President Truman and the American people are sound. It now seems to us that it is up to those engaged in science and industry to see to it that Congress passes correspondingly sound legislation to translate these recommendations into action.

German Economics

As DATA BECOMES AVAILABLE on German chemical plants and processes, there will be many cases where German costs for making a product differ widely from those in this country. Conclusions based on these data as to suitability or unsuitability of German processes for operation in the United States should be drawn only after careful study of all of the factors involved. Not only may German cost accounting methods differ from our own, but it is well known that there are wide differences between U. S. and German costs of common industrial requirements such as power, labor and raw materials. If the German data is to be of value, it must be used properly.

ONE VERY ABLE BUSINESS EXECUTIVE ended up a lengthy manual of procedure for his staff with this pearl of wisdom: "If in their practical application any of these instructions appear repugnant to reason and common sense, throw them out the window."

That's what we call leeway.



Adsorption—Desorption . . . solved a puzzle

ADSORPTION and Desorption are the newest processes employed in chemical industry. First, the proper grade of Nuchar Activated Carbon is carefully selected, and a study of the best conditions of temperature, pH, contact time, amount of adsorbent, etc., are necessary for the first reaction above. The ideal grade of Nuchar Activated Carbon will adsorb practically quantitative amounts or remove 100% of the product desired for final recovery. Then again, the adsorbent must readily release the desired product when treated with a preferential solvent. Here as previously, exact conditions as to type of solvent, temperature, pH, quantity of solvent, etc., are necessary to obtain maximum recovery of the desired product. The latest development in chemotherapy, the life-saver of thousands of our fighting men—Penicillin—is recovered in this manner. The methods employed in the preparation and recovery of Penicillin are only a fore-runner of similar products which are destined to appear in a post-war world.

The commercial processes which can make use of Adsorption and Desorption methods are many. In addition to Penicillin manufacture, the recovery of Iodine from well brines, and the stripping and recovery of dyes in the textile industry are but a few.

Many rare biologicals, chemicals and pharmaceuticals may possibly be recovered and purified by this method. Adsorption and Desorption methods lend themselves to recovery of valuable materials from wastes, and should be investigated by every industry with trade waste.

Nuchar Activated Carbon, an adsorbent with great surface area, tremendous reserve and adsorptive power, has been finding wider and wider application in the chemical industries. Write us for a generous sample. Our technical staff will be glad to assist you with valuable data.

Nuchar Activated Carbons ★ Abietic Acid ★ Snow Top Precipitated Calcium Carbonate ★ Liquid Caustic Soda ★ Chlorine Indulin (Lignin) ★ Liqro Crude Tall Oil ★ Indusoil Distilled Tall Oil ★ Tall Oil Pitch ★ Sulphate Wood Turpentine

NUCHAR

INDUSTRIAL CHEMICAL SALES

DIVISION WEST VIRGINIA PULP AND PAPER COMPANY

230 PARK AVENUE, NEW YORK 17, N.Y. — 35 E. WACKER DRIVE, CHICAGO 1, ILLINOIS — 748 PUBLIC LEDGER BLDG., PHILADELPHIA 6, PA. — 844 LEADER BLDG., CLEVELAND 14, OHIO

CSC BUTYL ESTERS

Write for samples and technical data on these versatile chemicals.

BUTYL ACETATE

High-quality, medium-boiling liquid with many industrial possibilities. Its essential solvent in lacquers. Used in making a variety of products including perfumes, inks, and photographic film.

BUTYL BORATE

High-boiling; widely miscible; stable when moisture free. Hydrolyzes rapidly in the presence of water and deposits its boric acid crystals, suggesting usefulness in antiseptics, fire-proofing agents, and numerous preparations.

Available after the war.

BUTYL CITRATE

Highly efficient anti-foam agent for many water dispersions. Advantageous for its oil and grease resistance, and adhesion promoting properties when used as the plasticizer for lacquers and resins.

BUTYL OLEATE

An oleaginous, light-colored, super-high-boiling liquid. Especially valuable for its lubricating, plasticizing, and water-resisting characteristics in coatings, polishes, and water-proofing compounds.

Available after the war.

BUTYL LACTATE

Widely useful, high-boiling solvent for oils, synthetic resins, natural gums, and synthetic resins. Its penetrating characteristics make it especially useful in inks, dyestuffs, wood stains, and textile specialties.

BUTYL OXALATE

An exceptionally pure chemical useful in organic syntheses. It has solvent properties of interest for special uses.

Available after the war.

BUTYL PHOSPHATE

Stable, colorless, high-boiling, low-melting solvent and plasticizer for cellulose ester lacquers. Useful in pigment grinding, and as an anti-foam agent.

BUTYL PHTHALATE

Colorless, odorless, and practically non-volatile. Standard plasticizer for cellulose ester lacquers, and other plastic coating and molding materials. Among its many uses, it is an excellent textile lubricant, anti-foam agent, and grinding medium.

BUTYL SEBACATE

One of the best plasticizers for polyvinyl butyral plastics, cellulose esters, resins, and synthetic rubber. It offers many possibilities such as a perfume fixative, textile lubricant, heat transfer medium, liquid dielectric, and anti-foam agent.

BUTYL STEARATE

Useful lubricating and plasticizing agent. Excellent as an ingredient of polishes, creams, and water-proofing agents; and in textile molding, and other lubricants. Plasticizer for laminated products and special coatings.

COMMERCIAL SOLVENTS *Corporation*

17 East 42nd Street, New York 17, N. Y.

Chemical Industries
AUGUST, 1945

War Also Catalyzes Chemical Commerce

By WILLIAMS HAYNES, Stonington, Conn.

EMPHASIS ON THE technical developments and new products born of chemical industry's war effort tends to obscure the commercial changes wrought by a world-wide conflict. The analysis on these pages of the effects of the First World War upon American chemical trade is suggestive of an evolution that is sure to follow V-J Day and which already deeply concerns forward-looking executives. It is one of the chapters from Mr. Haynes' forthcoming two volumes covering the World War in his six-volume "American Chemical Industry."*

WAR CATALYZES chemical progress. Its stimulating effects have been increasingly great with each succeeding major conflict during the past two centuries. Similar causes, intensified and magnified, have resulted in corresponding, richer technical accomplishments.

During the Napoleonic Wars the British blockade cut off France from supplies of potash from Scandinavia, Russia, Scotland, and Spain, resurrected the Leblanc soda process destroyed during the French Revolution. Later, because England was the first to remove the high war taxes on salt, Muspratt successfully transplanted Leblanc's discovery, taking from France the foundation whence sprang the heavy chemical industry. The chemical history of the First World War is an amplification of that same theme; that of the Second World War, when it is written, will be a modernized version.

The chemical industry, itself, is affected greatly by these periodical bursts of technical activity. The same martial influences often compel and sometimes persuade quite revolutionary changes in the organization, commercial practices, and policies of chemical manufacturers. This was notably true during the war years, 1914-18, and the reconstruction period that immediately followed.

As it is impossible to separate the chemical industry from the chemical science upon which it is based, so chemical manufacturing cannot be uprooted from its contemporary economic environment. No human activity operates in a vacuum, and since the principal business of the chemical maker is to supply materials for processing to every other industry, this type of enterprise is intelligible only if considered in relation to the technical and commercial developments of the entire country. During the period of the earlier global war important basic changes throughout our national economy influenced the chemical industry.

FOREIGN TRADE BOOM

Most fundamental of these changes was the sudden transformation of the United States from a debtor to a creditor nation. Coming amid the confusion of the war, it is not remarkable that American industry and agriculture failed to adjust to this radically new condition or that our leaders did not grasp its full meaning. Superficially, the manifestation of this change was most obvious in our foreign trade relations. As the National City Bank pointed out,[1] our "favorable trade balance" was greater during the war period than during the 125 years since the adoption of the Constitution, the excess of exports over imports during the 51 months of the war being $10,900,000,000, while that from 1788 to 1914 was $9,007,000,000.

The new character of our exports was also significant. In the period from 1910 to 1914, 33.1 per cent of our foreign sales was of raw materials; from 1915 to 1920, 17.6 per cent. During these years, the percentage of exports of maufactured goods increased from 30.7 to 39.2 per cent.* The greatest percentage of increase came in the foodstuffs field, but this was temporary. It is notable that despite the marked increase in the foreign sales of manufactured wares, in 1922 we exported only 4.3 per cent of our total production of manufactured goods. Only three industries, motor cars, typewriters, and sewing machines sold more than a quarter of their output abroad.

On the import side of our trade ledger, the tendency, marked since 1890, for the appetite of our factories to grow faster than that of our people was greatly accelerated. Imports of industrial raw materials grew from roughly a third to over half of the total. The big items in our $4,000,000,000 purchases abroad were rubber, silk, coffee, sugar, wool, and wood pulp, most of them raw materials of the industries that are conspicuous consumers of chemicals.

High hopes were roused that the enor-

* To be published by D. Van Nostrand Co., Inc., New York. The first two volumes are scheduled to appear in October.

* For the changed basic conditions of the 1912-22 period, see Carver, *Present Economic Revolution in U. S.*; Slesson, *The Great Crusade and After*; Ayres, *The War with Germany*; Clark, *History of Manufacturers*. III, pp. 324-58; Friedman, *International Commerce and Reconstruction*; Edie, ed., *Current Social and Industrial Forces*.

mously expanded export business could be held after the war. One of the earliest tangible expressions of this vision was the Webb-Pomerene Law, sponsored by the Administration and signed by President Wilson, April 11, 1918. This measure authorized combinations of persons, partnerships, and corporations for carrying on export trade and exempted them from the anti-trust provisions of the Sherman and Clayton Acts. This enabled American manufacturers to meet on equal terms the cartels and trading associations common among the manufacturers of other countries.[2] Many industries expressed a lively interest in the possibilities thus opened up, and the Federal Trade Commission organized an Export Trade Division for the specific purpose of assisting in the organization of export trade associations under this Act.[3] It was proposed that the entire chemical industry band together in such an export association under the auspices of the Chemical Alliance. A committee was appointed,* but a number of the larger heavy chemical companies which were never very enthusiastic about the prospects of postwar foreign trade, hesitated to commit themselves to this idea, so it fell through.[4] However, several smaller groups with the advantage of a simpler common purpose, took up this idea and Webb Law export associations were formed in the alkali, phosphate rock, sulfur, and naval stores industries.

It is understandable why these cooperative foreign trade organizations were popular and successful among producers of basic commodities sold on the basis of internationally known, thoroughly standardized grades, and why they made little appeal to manufacturers selling individualized, branded goods. The alkali industry is only an apparent exception. The various grades of both caustic soda and soda ash have long been thoroughly established upon a basis of chemical content, and for export purposes it was practical for the United States Alkali Export Association to allocate orders impartially and even to ship material satisfactory to the foreign buyer without identifying manufacturers' marks. Other groups among the industrial chemicals could meet these prerequisites for the smooth, successful operation of an export pool. The makers of the coal-tar and the so-called fine chemicals were generally unwilling to forego the individual advantages which they valued so highly in their trade names and trade-marks.

Following the Armistice, the interest in foreign trade sparked by the war business flamed up in many industries which previously had done little exporting. The new importance of American chemicals in world trade had been recognized by the National Foreign Trade Council when it invited Henry Howard, then executive committee chairman of the Manufacturing Chemists' Association, to address its meeting held in Cincinnati, April, 1918. Discussing foreign trade, he said, "In my opinion, the permanency of our foreign trade can only be assured in the fierce competition sure to follow this war, through the organization of exporting agencies by different industries so that these industries will work for foreign trade as a unit, avoiding all competition between their members in foreign markets and fighting our foreign competitors."[5]

A year after the Armistice, a great International Trade Conference was held in Atlantic City, October 22 to 24, and a special chemical committee,* headed by Charles H. MacDowell, was named to meet with foreign delegates.[6] Even in the midst of the conflict, in August 1916, the American Manufacturers' Export Association of New York City sent a committee to visit France, and Frederic J. Le Maistre, then associated with the Research Department of Du Pont, surveyed the French chemical industry and prepared a special report.[7] In a similar effort, the American Chamber of Commerce in London in 1919 appointed an advisory committee† on drugs, chemicals, and dyestuffs to encourage trade between Great Britain and this country.[8]

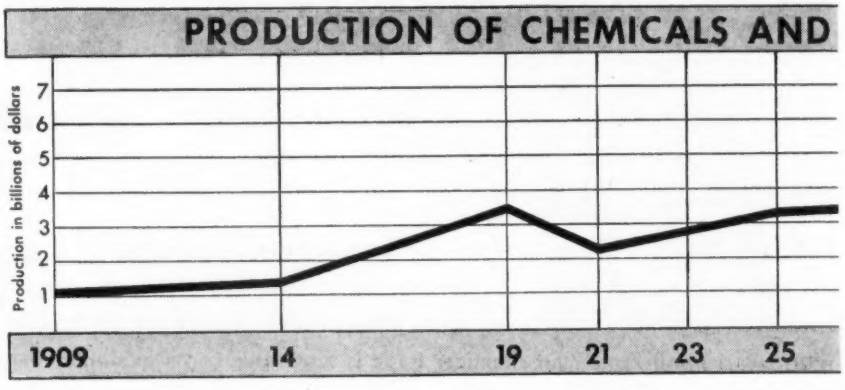
In the chemical industry interest in export markets was fanned during the first two years after the war by a lively, but short-lived foreign business. Even European countries, short of many chemicals because of the total dislocation of all producing facilities and the accumulated needs of agriculture and industry, placed sizable orders here and begged for rush shipments. This windfall of exports greatly helped reconversion to a peacetime basis. It took war surpluses off the market and assisted many plants to smooth out reconversion problems. Finally, this foreign demand supported the market at a critical time, easing the price decline.

By the middle of 1920, however, foreign buying began to ease up.[9] European chemical manufacturers were rehabilitating their plants and re-establishing their prewar connections. In an amazingly short time they recaptured their old customers, even the South American markets, where some optimists had believed we were the logical suppliers.

GAINS AND LOSSES

We had done a good deal during the war to prepare the way for reopening these old trade channels. Since most of the sales abroad had been made by speculators and other secondhand dealers, from Sweden to Siam all our chemical shipments had been made at prices exorbitantly high even for that period. American manufacturers selling to American consumers on contract had frequently delivered the bulk of their output at prices far below the New York spot market. But when it came to foreign sales, even conservative trading houses were apt to charge all the traffic would bear. Foreign buyers resented what seemed to them a wicked exploitation of their desperate needs. Sales made by irresponsible speculators were too frequently marked by deliberate sophistication: common rock salt shipped for alum; sodium salts for potash salts; scores of such frauds and substitutions. Quite ignorant of the standing of the firms with whom they were dealing, with no knowledge of the gambling in the spot market here, foreign buyers quite unjustly pictured the American chemical manufacturer as a combination of highwayman and card sharper.

Foreign buyers had another complaint. They were accustomed to receiving chemicals in certain grades which differ somewhat from usual American standards and large sections of the globe used the metric system of weights. In the rush of war activities, it would probably have been quite impossible to meet these requirements, but the American manufacturers'



* Members were: Dr. W. H. Nichols, L. H. Atkinson, Daniel J. Lyne, Henry Howard, H. G. Clopper, George N. Eno, M. Peterkin, Dr. B. C. Hesse, F. B. Leary, Dr. Bernard Herstein, tech. advisor.

* E. T. Connelly, acting sec'y of the Mfg. Chemists' Assoc., served as vice-chairman and sec'y and A. P. Perkins was asst. sec'y. The other members were Horace Bowker, Albert R. Brunker, M. F. Chase, E. R. Grasselli, W. H. Childs, H. H. Dow, H. H. S. Handy, Henry Howard, Wilbur C. Miller, J. D. Pennock, C. L. Reese, A. G. Rosengarten, E. M. Sergeant, Alonzo E. Taylor, Henry Wigglesworth, and F. P. Garvan.

† Members were Irving Keene, Keene Co., chairman; C. J. Fisk, Parke, Davis & Co.; C. W. Barnes, Armour & Co.; J. Knights Trench,, Brotherton Ratcliffe Co.; W. Mann, Mann & Cook; M. J. Pugh, London Chemical Works; F. G. Gill, Monsanto Chemical Works; H. W. Mills, Fabra Co.; J. E. Ellis, John Ellis & Co.; G. H. Gerson, American Commerce Co.; G. Chiles, Thos. Morson Co.

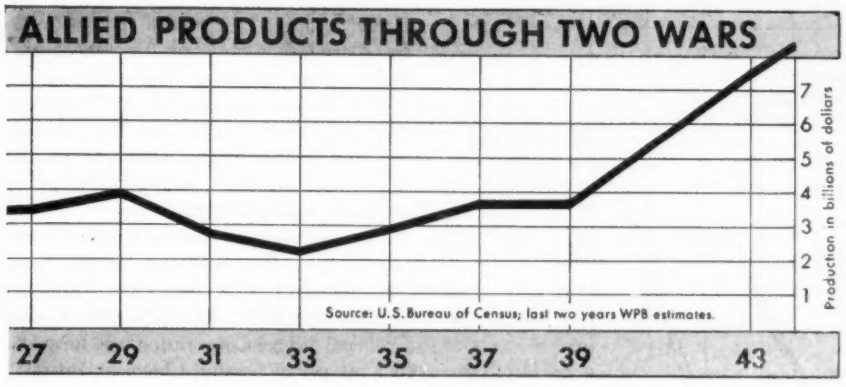
comparative indifference to foreign trade has always been signalized by unwillingness to modify manufacturing operations or packaging to suit the buyer abroad.

The plain fact is that in normal times the American chemical industry, serving the biggest consuming market in the world, busy developing new products for domestic trade, has little interest in export business. Except as a dumping ground for surplus stocks during times of depression, this preoccupation with home markets persisted right up to World War II.

The sensational expansion of our foreign chemical trade during the First World War was overshadowed by revolutionary internal developments. The growth of all American industries was so enormous, the use of chemicals in many fields increased so rapidly, that the American chemical manufacturer had little time to cast longing eyes at Brazil or China. He did not need to learn that what Frank J. Goodnow characterized as "the vegetable civilization of the Chinese," with four times our population, produces but a seventh of our work output.[10] He did not need the flattering index numbers of the National Industrial Conference Board —1899, 100; 1914, 156; 1919, 198;—to realize the rapid growth of his domestic customers. There were thousands of reasons supporting an expansive optimism

"The war left American manufacturers with overgrown plants, an excess of raw materials, and an arsenal of new ideas. The last," as Victor Clark sagely observed,[11] "has probably influenced the following era more than either of the former." Cooperation together and with the Government in the war effort had two effects. It had brought competing manufacturers together in a common cause, establishing personal relationships and building up a sense of industry consciousness. Contacts with the Government frequently developed friction, but each side learned the other's problems and point of view. The astonishing accomplishment of industry won from Government admiration which was expressed in a more lenient, or at least a more discriminating, approach to business problems. This attitude was evidenced by a conscientious, successful effort to reduce taxes, by less rigid administration of the anti-trust laws, and by active cooperation, especially upon the part of the Department of Commerce, and by encouragement of trade associations in cooperative efforts to stabilize markets, collect statistics, promote sales.

The war effort also roused new ideas of industrial efficiency. This was the period of the Taylor School of time studies, work standards, incentive wages, initiated during the war and carried over into the reconstruction period. The functions of purchasing, personnel relations, advertising, market study, technical service to customers, all became specialized departments. Successful executives no longer relied implicitly upon their own experience and intuition, but buttressed their decisions with expert advice. Chemists and physicists, economists and psychologists, found places on the pay roll. Technically trained men began climbing up the business ladder. To have "polished up the handle of the big front door" was no longer considered the only proper apprenticeship. Even a course in bookkeeping at a local business college was not enough. The Harvard Business School and the Wharton School in Pennsylvania were crowded with eager students.



The chemical industry reacted to these stimuli characteristically. Of necessity more interested in research than its contemporaries, it increased its technical staffs; built new, bigger laboratories and equipped them lavishly. Branching out from routine analysis and process testing, industrial research departments undertook important, fundamental research in pure science. It was a time when great consultants stood forth prominently and such men as Arthur D. Little, John E. Teeple, William M. Grosvenor, Milton C. Whitaker, Albert E. Marshall, the brothers Hirsch, William Hoskins, and Carl S. Miner in Chicago and Samuel P. Sadtler in Philadelphia, wrote, or should we say underwrote much of chemical history.

Recognition of the technically trained men extended even to the sales department. Expert advice to customers and prospects became a regular part of chemical selling. At first, these technical services were rendered by a special staff whose members always went out carefully chaperoned by an experienced salesman. Gradually, however, the question was raised, Why not technically trained chemical salesmen?

SELLING TO THE FORE

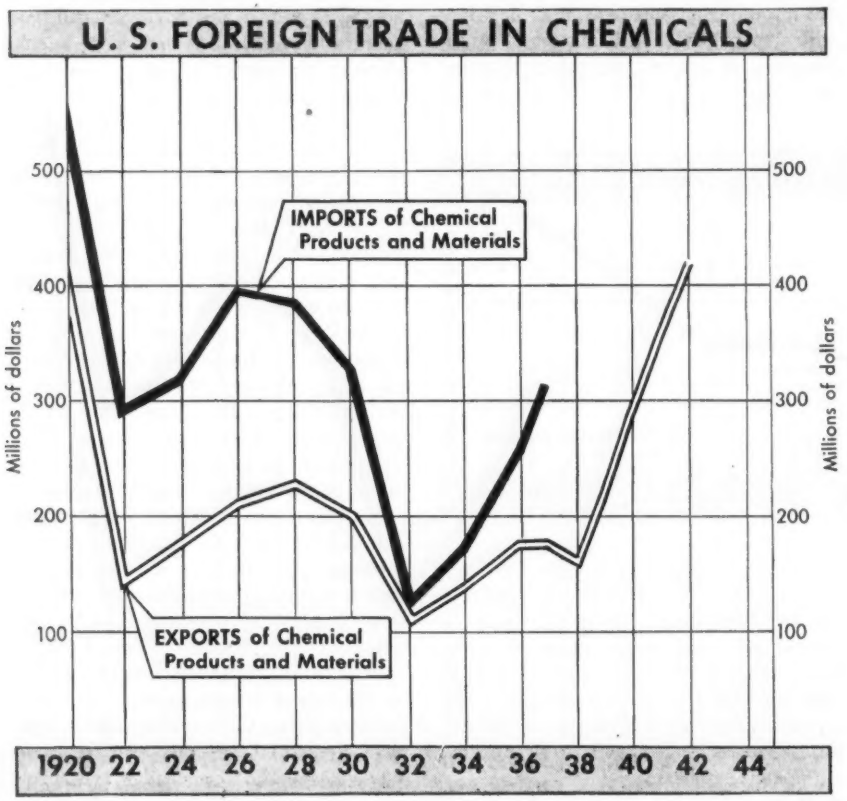
A notable change of the early postwar years was a sweeping revision of the industry's merchandising system.[12] The replacement of sales agents by the companies' own salesmen was a gradual evolution which the upheaval of the war brought to a climax. The earliest American chemical manufacturers were practical production men. Today we would call them chemical engineers, although not all had any formal chemical education. After supplying their friends and neighbors, who had frequently encouraged their venture, they extended their sales by employing the merchandising machinery which they found ready-made. Their foreign competitors handled American business through exclusive sales agents. These firms, commonly individually owned or partnerships, situated in the big cities on the Atlantic seaboard, were direct descendants of the merchant-traders in Boston, New York, and Philadelphia, with commercial pedigrees tracing back to colonial days. Through contacts with European manufacturers and firsthand dealers in the primary markets for natural raw materials, these importing houses usually built up a complete line of chemicals, drugs, dyes and tanstuffs, paint pigments, varnish gums, waxes, and oils.

In the earliest days, drugs and paint materials were often the backbone of such businesses, but as the country grew, importers began to specialize in drugs and spices, industrial chemicals, paints and oils. As the population moved Westward, local chemical distributors appeared in the inland centers, and as the local markets grew, the evolution from complete to specialized lines was repeated. These dealers in the smaller and inland cities drew their supplies from the direct importers at the seaports. Again, as time went on, the more aggressive distributors in the larger centers, as Whitelaw Brothers in Kansas City and St. Louis, and Eaton Clark Company, Detroit, either became exclusive subagents or made direct connections abroad. It was a flexible informal system, well adapted to distribute imported materials.

To save the cost of ocean freight was the primary economic justification for American-made chemicals, and to break into the market, domestic manufacturers used this cost lever. It was to the advantage of the local distributor to buy direct from these producers rather than from the importers. It was to the advantage of the chemical manufacturer, lacking both selling experience and the capital to organize a sales force, to distribute through these local jobbers whose reputation, credit responsibility, knowledge, and staffs were all at his disposal. This cutting in beneath and behind the direct importers forced them, as chemical manufacturing grew, to drop gradually

their foreign connections and become sales agents for American producers. But the evolution again repeated itself, and as the markets grew and their products diversified, more and more of the producers began to develop their own sales forces and handle their own selling direct.

This third transition began about the turn of the century. The older alkali companies, for example, sold through agents—Solvay through Wing & Evans, Michigan through Edward Hill's Son—the newer ones, Diamond and Mathieson, sold direct. Union Sulphur sold exclusively through dealers and Freeport appointed Parsons & Petit exclusive sales agents, but when Texas Gulf came along, while it used H. J. Baker & Bro. in the fertilizer field, it sold other industries direct.



Note: The above includes the following export and import classifications: chemicals and related products; crude drugs; naval stores; oilseeds; vegetable oils; vegetable dyes and tannins; inedible animal products. 1940 and following years are estimates based on Bureau of Foreign & Domestic Commerce data.

Several elements in the war situation fomented the final stage of this merchandising evolution. The chemical market deepened and broadened. Consumption of chemicals increased enormously, and chemical manufacturers increased the variety as well as the quantity of their products. These were the exact conditions making direct sales by producers more practical and more profitable.

The disruption of the old selling system by the invasion of an army of irresponsible gamblers during the war gave chemical manufacturers both a motive and an excuse for taking sales into their own hands. It galled them that the chemicals they made and delivered to jobbers and industrial consumers on contract schedules at contract prices, were resold with fancy profits to speculators, who resold at pyramided prices. In many cases, it became obviously more profitable to gamble in chemicals than to manufacture them, and so long as the war lasted, it was an absolutely safe gamble. Aside from increasing production to secure a surplus over their contract requirements, there was little the manufacturers could do, and what upset them profoundly was that the full odium of the speculative prices was thrown in their faces. Conscious of doing a good job, they resented the ill will and reprobation they incurred. The natural reaction of the larger companies, which because of large output or variety of products could justify their own sales departments, was to adopt direct selling.

Once more the adaptability of the merchandising system was demonstrated. The speculators disappeared in a cloud of lawsuits and bankruptcies. The established, reasonable local distributors continued to serve the small chemical makers. The evolutionary process was continued along new tracks, so that during the next decade, while many chemical merchants were compelled to concentrate upon certain products for particular markets, others joined the growing army of manufacturers of all sorts of chemical specialties.

CONSOLIDATION

Another natural progressive evolution in the organization of the American chemical industry culminated during the World War I period. The proprietor and the partnership were gradually replaced by the corporation and by 1920 the individual management had virtually vanished, thus closing another definite phase of the industry's development in this country.

Along with the rise of the corporations had come notable increases in the amount of working capital available and the growing habit of adding new lines of products by the simple expediency of purchasing an established company. The antitrust laws encouraged this type of diversification. An aggressive, successful management, forbidden to expand in its own line by absorbing its direct competitors, naturally turned to new fields to conquer. Without this compulsion, it is quite conceivable that we might have built up in the United States a series of companies each dominating a chosen field, such as heavy chemicals, alkalies, fertilizers, fine chemicals, and the like. By a combination of these few giants, a single great chemical company, comparable to the British Imperial Chemical Industries or the German I.G., would have been the logical, eventual conclusions. Forced by law to go out into new fields, American chemical consolidations from the very first acquired a breadth and diversity of interest and products, making for great strength and stability.

Two conspicuous examples reveal very clearly the pattern laid down at this time and followed by the many mergers of the 1920's. December 17, 1920, the Allied Chemical & Dye Corporation was formed* by a merger of General Chemical, Barrett, National Aniline, Semet-Solvay, and Solvay Process. It was effectuated by the exchange of these companies' stocks for stock of the new corporation. It brought together very important producers in the heavy chemical, coal-tar crudes and finished products, and alkali branches of the industry.[13] In 1921 the E. I. du Pont de Nemours & Company realigned its executive organization, setting up five industrial branches under separate general managers: Cellulose products, R. R. M. Carpenter; explosives, C. A. Patterson; dyes, C. A. Meade; paints and chemicals, Hunter Grubb; Pyralin, C. W. Phellis. At the same time, six auxiliary departments were created, as follows: legal, J. P. Laffey, chief counsel; development, Finn Sparre, director; engineering, S. M. Pierce, chief engineer; chemical, C. L. Reese, director; service, W. B. Foster, director; advertising, C. F. Brown, director.[14] Both merger and reorganization exemplify vividly the principle of close interrelationships of raw materials, products, and by-products, which governed the third great consolidation of the war period, the Union Carbide & Carbon Corporation, and which was to govern the evolution of the modern American chemical industry during the postwar period.

No other American industry had grown more rapidly during the World War I period. Companies with an authorized capital of $513,383,000 had been incorporated to manufacture chemicals, dyes, and drugs,[15] while the Census figures

better than doubled, in size and strength. It had added some entirely new branches; perfected some radically new techniques; opened up new and promising markets. The war experience had taught it its own prowess and revealed to everyone its importance to the nation.

REFERENCES

1. *Drug Chem. Mkts.* 13 (Feb. 5, 1919).
2. *Ibid.* 12 (Apr 17, 1918); *O.P.D.. Reptr.* 16 (June 18, 1917), 23 (Dec. 17, 1917), 25, 28 (Apr. 15, 1918); Fed. Trade Comm., *For. Trade Ser. No. 1*, 1919.
3. *O.P.D. Reptr.* 27 (Dec. 23, 1918).
4. *Drug Chem. Mkts.* 7 (Feb. 5, 119).
5. *Ibid.* 7 (Apr. 24, 1918).
6. *O.P.D. Reptr.* 28 (Nov. 3, 1919); *J. Ind. Eng. Chem. 11*, 1095 (1919).
7. *J. Ind. Eng. Chem. 9*, 229 (1917).
8. *O.P.D. Reptr.* 84A (June 2, 1919).
9. *Drug Chem. Mkts. 8*, 351 (1921).
10. Wile, *A Century of Industrial Progress*, pp. 91, 95.
11. Clark, *History of Manufacturers in U. S.*, III, p. 324.
12. For detailed discussion of chemical marketing, see Haynes, *Chemical Economics*, Chap. 5.
13. *Com. Fin. Chron.* 1087 (Sept. 11, 1920); *Drug Chem. Mkts.* 7, 545, 1337 (1920); *O.P.D. Reptr.* 29 (Sept. 6, 1920); *Fortune* 81 (June 1930), 183 (Dec. 1934).
14. *J. Ind. Eng. Chem. 13*, 1086 (1921).
15. *N. Y. J. Com.*, quoted in *Drug Chem. Mkts. 6*, 73 (1920).

* Incorporated in N. Y. with $179,051.621.42 capitalization, for which the issued capital stock was 2,143,455 shares of common and 373,264 preferred. The bd. of dir. included Wm. H. Nichols, chairman, Orlando F. Weber, pres., Wm. H. Nichols, Jr., Eversley Childs, Wm. J. Matheson, E. L. Pierce, H. H. S. Handy, Rowland Hazard, Armand Solvay, Emmanuel Janssen, and Roscoe Brunner.

PENETRON — Non-Piercing Liquid Level And Wall Thickness Gauge

BY THE USE of gamma rays from a milligram of radium, electronic and radioactive principles are utilized in a new device to provide inspection data on pipe lines, vessels, and their contents without disturbing the material being inspected. Called the Penetron, and developed by the Texaco Development Corp., the device is capable of measuring the thickness of a wall or locating the liquid level in a vessel without access to the other side of the wall or the interior of the vessel. The instrument weighs about 40 lbs. and is operable by one man. It is sold and manufactured by Engineering Laboratories, Inc., Tulsa, Oklahoma.

Until the advent of the Penetron all existing methods of measuring wall thickness of tanks or pipes either have involved piercing of the material being examined, have been time consuming, or have involved the use of cumbersome equipment, while determination of a liquid level or a liquid interface has usually involved installation of equipment inside the vessel. The Penetron need only be placed in a position outside the wall to make any of these measurements.

In operation the radioactive source is placed next to the wall of the vessel so that the gamma rays penetrate the wall. Part of these rays are scattered in all directions by the wall material, some being reflected back to the Penetron. The intensity of this "back-scattered radiation" is in proportion to the thickness of the wall.

The radiation picked up by the detector is converted into direct current and measured by an indicating microammeter, the reading of which is converted into wall thickness by means of calibration curves (Fig. 1). The calibration curves for a wall of a given composition will vary depending on the shape of the wall being measured and, if a curved surface, on whether the measurements are made from the outside or from the inside. The curves are not affected by small changes in the chemical composition of the wall.

With any electronic equipment, failures of tubes, condensers, or other parts of the circuit have to be expected. In order to detect such failures the overall performance of the instrument can be checked by measuring the thickness of a set of concentric half-round steel shells (Fig. 2) against a calibration curve.

The accuracy of the Penetron has been established as plus or minus 3 per cent. It should be noted, however, that it measures the average thickness over an area of approximately one square inch and thus cannot be used for the detection of pin-holes or pin-hole type corrosion.

For liquid level determination the head of the Penetron is placed on the wall of the vessel above the level of the liquid. In this area the back-scattered radiation will be due to the wall of the vessel and as the head is moved down the wall the reading remains constant until it reaches a point opposite the level of the liquid, where an increase in the back-scattered radiation indicates the presence of the liquid.

The interface between two fluids of different densities can be located in a similar manner. Fluid densities may also be determined, and by proper instrumentation the Penetron may be adapted to control purposes, and a continuous record of the location of the levels may be obtained by employing a recording device.

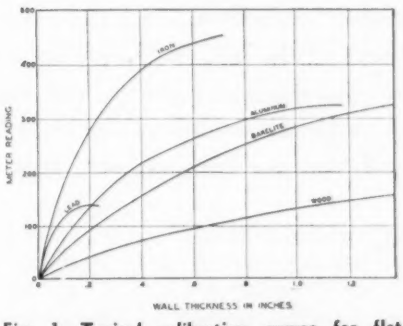


Fig. 1—Typical calibration curves for flat plates of various materials.

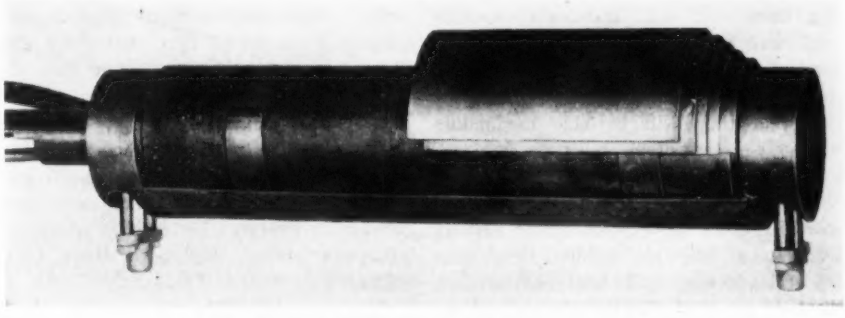


Fig. 2—Concentric steel shells for routine calibration.

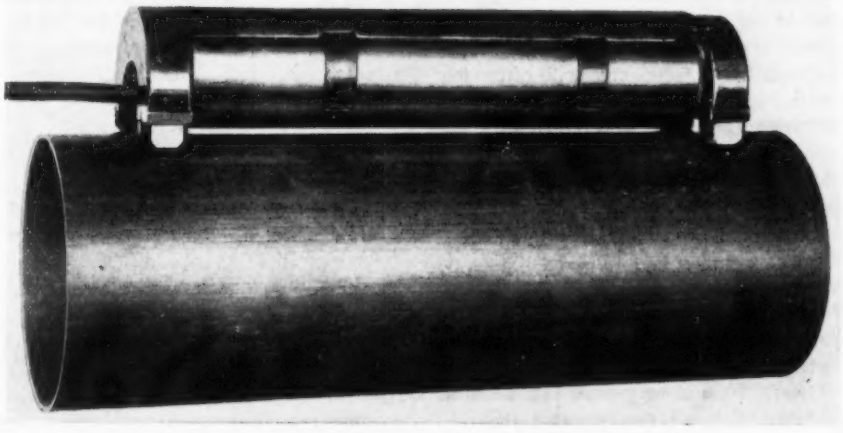


Fig. 3—Penetron head held in position by magnet type holder.

This service flag, designed by the Philadelphia Bulletin, is being copied throughout the country to show how many discharged veterans have returned to their jobs.

CHEMICAL INDUSTRY Prepares For the RETURNING VETERAN

EDITORIAL STAFF REPORT

UPPERMOST IN THE MINDS OF MANAGEMENT is the problem of reabsorbing veterans into the chemical industry in accordance with the requirements of the law. Following up our discussion in June of the employer's responsibilities, we present here the results of a questionnaire sent out to 75 chemical companies in order to learn of their plans—not only how they will fulfill the law, but, more important, how they will go beyond it.

SOMETHING new has been added to service flags all over the country. Many are going up with the honorable discharge insigne under the blue and gold stars to show how many former employees have returned from the service to their jobs. A lot of employers are greeting these men with thoroughly worked out plans for giving them their old jobs or better ones; others, unfortunately, are proceeding "by guess and by gosh," hoping that they will be able to muddle through the requirements of the law.

How many will seek their old jobs? At this early stage, there is no apparent correlation of the experiences of various companies: one has rehired less than ½ of 1 per cent, while another has taken back 66 out of 68. On the average, 50 per cent are seeking their old jobs. Still others have not had to face the problem as yet, since none has returned. As we pointed out in the June article, it is natural that those first returned, coming back to an expanded war economy, will often find more lucrative and pleasant employment elsewhere, but those who return after war production has dwindled to a trickle will doubtless be happy to get back into the fold. There is a clear danger—that most of them will be coming back when industry is least able to absorb them without grave dislocations. The argument is often heard that no reconversion is necessary in the chemical industry—that the products of peace are essentially the products of war. This is very true, but we must not lose sight of the fact that the *consuming* industries will have to reconvert. As one personnel manager said, "We can turn out our civilian product two days after we're through with our war contracts, but our consumers won't be ready to buy them."

Only a third of the companies contacted had made any attempt to find out what proportion of their service employees expected to take back their old jobs. Those who did discovered that almost all of them (the average was 94 per cent) wanted to return. One reported, for instance, that 98 per cent of them intended to come back. Of these, 76 per cent wanted their old jobs, and the remainder expected better jobs. Another company almost duplicated these percentages.

On closer analysis, the question does not mean very much. The serviceman has nothing to lose and everything to gain by replying that he intends to rejoin his former employer—even if he has no intention of doing so. Such a response is a "safety net" if he should fall from his loftier ambitions.

WAR-WON ABILITY

Speaking of "loftier ambitions," there is a large group—and these are not the psychoneurotics nor the disabled, which we shall discuss below—who should not seek their old jobs, and the sensible among them realize it. These are the ones who have outgrown their jobs during their years in the service.

Suppose an 18-year-old messenger boy joined the Air Forces and came back four years later as a 22-year-old lieutenant colonel. It would certainly be folly for him to consider his former job; but it might be ill-advised—and this is the point one personnel director made—for him to accept a better position with the same company. His associates would still think of him as the messenger boy and unconsciously belittle his newly-gained maturity.

An actual case in point is the boy who was making $225 per month when he left for the Army. His war experiences were roughly parallel to those of the hypothetical messenger boy described above, and when he returned for an interview with his employer, suffering from delusions of grandeur, he asked for $450!

Still another was earning $135 in 1940 as a graduate chemical engineer. He entered the Army in 1941 and became a major. While the salary scale for his type of work has risen considerably in his absence, it is still well below his Army pay. Will he be able to readjust himself to a lower standard of living?

Two or three significant points are apparent from these examples:

First, some men will be too good for their old jobs. Both employer and employee will gain if the serviceman's newly-developed skills or qualities of leadership and responsibility are capitalized upon in a more responsible and better paying job. Second, the returned employee will command greater respect for his new position if his close associates do not remember him as an inferior. For this reason a transfer to a different department might be advisable. And last, the employee must realize that specialized training in the service which enabled him to rise in rank will not necessarily be reflected in enhanced value to his employer. Indeed, even though he rose to a colonelcy by virtue of his adeptness in military strategy, he is probably a worse chemical engineer than he was when he left for the Army. He must accept that incontro-

vertible fact with as much grace as he can muster, and with the same grace must he accept a civilian salary commensurate with his civilian ability.

"PSYCHONEUROTICS"

Reemployment of the veteran whose abilities and value—at least in his own eyes—have increased beyond the opportunities of his former position is bound to create difficulties in placement, dissatisfaction on the part of the employee, and possibly a persuasion of maltreatment. Even more difficult, very likely, will be the reemployment of the returned serviceman whose value is definitely lessened—the "psychoneurotic" and the disabled.

Dr. G. H. Gehrmann, medical director of the du Pont Company, denounces the loose use of the term "psychoneurotic." It has been used so much by laymen with no thought or knowledge of its medical significance that a great number of people fully expect that most of the returned servicemen will be "queer" or "cracked."

As a matter of fact, in the sense that the term is usually misused, all of us are "psychoneurotic," Dr. Gehrmann pointed out. That is, all of us have quirks in our personalities that can be considered deviations from the normal. We may have a taste for loud ties or not feel in the mood to say "Good morning" until after 10 o'clock, but we should certainly resent any implications that our behavior was due to mental derangement!

So does the veteran, through his spokesman, the *Stars and Stripes*, service newspaper, lash out at those who would treat him differently from a "normal" individual—as something apart from the common run of human beings.

There are some, of course, who need trained psychiatric treatment in order that they might readjust to civilian life, but "treatment" should not come from well-wishing but untrained laymen such as foremen, supervisors, and the like. The great majority will respond better to disregard of, and indifference to, physical disabilities or any personality differences that may have been intensified by the personal crises of war.

In the du Pont organization a staff psychiatrist has given lectures to foremen and supervisors, instructing them in the best way to handle problems that arise from these causes. The greatest benefit of such a program, Dr. Gehrmann believes, is to enable supervisors to recognize where psychiatric help is needed, and to realize that they, as laymen, are not equipped to render such help.

DISABLED VETERANS

But even if the man is psychologically adjusted—as indeed he can be in the majority of cases, how about the physical adjustment of the disabled veteran to his job?

It is the contention of those who have had experience with disabled workers—whether veterans or not—that they are often better workers than the physically sound. In this regard, the article "Disabled Veterans, an Economic Asset" in the May, 1945, issue of *Domestic Commerce* says:

"Business and industry cannot be expected to keep the disabled veteran employed unless he can offer services in return—unless he is economical labor. Will he be? Here industry may speak for itself, for certain companies have had long-term experience with disabled employees, and other firms have developed programs during the present emergency using both disabled veterans and civilians.

According to scattered but fairly comprehensive data of the Research Institute of America, there is 7 per cent less absenteeism and turnover, and a 14-per cent lower accident rate among handicapped workers than among those without handicaps. The general conclusion of the many companies is that the disabled worker is a highly efficient producer—if the right job is found for him."

The du Pont Company has at least one doctor in each plant who is familiar with the physical requirements of the jobs in the plant. The right job is found for the disabled worker by a consideration of the following questions: What is he physically *able* to do? What is he *trained* to do? What can he *safely* do? and, What does he *want* to do?

Almost half of the companies who responded to the questionnaire had definite plans for hiring disabled veterans. One mentioned a two-fold program of employee training and job engineering and simplification; others mentioned concrete collaboration of safety and medical departments with production departments. Many had completed surveys of the jobs in their plants, appraising them as to their physical requirements. The Colgate-Palmolive-Peet Company, for example, has a "Job Survey for Handicapped Employees" listing, with the job title, those members or functions of the body without which the work could be accomplished (*e. g.*, 'one arm,' 'both arms,' one or both legs, hands, feet, 'eyesight,' 'hearing,' 'voice') and physical elements ('pushing or pulling,' 'bending,' 'walking,' etc.) not necessary to performance of the work.

It is a little surprising, however, to note that very close to half of the responding companies had no—or, at least, vague—plans for taking care of their disabled former employees. They were equally divided between those who admitted to no provisions and those who would "employ them if possible" or "will try to find jobs for them."

Many of the smaller companies, of course, do not have the facilities to carry out as complete and detailed programs as the larger firms, but they can enlist the aid of the War Manpower Commission and the U. S. Employment Service, which has prepared a check list for job evaluation. Another helpful organization is the American Veteran Association, Inc., 271 Madison Ave., New York 16, N. Y., which offers a leaflet, "Jobs for the War

CAN YOU ANSWER THESE?

Have you contacted your former employees now in service to determine whether or not they intend to seek their old jobs? If so, what did you learn?

In cases where a succession of employees have been drafted into the service from the same job, will you try to rehire all of them?

Does the same apply to those who were drafted out of temporary jobs — jobs that were available only because of wartime exigencies?

What provisions have you made, or expect to make, for disabled veterans?

Will your returned veterans be retroactively entitled to group benefits, such as pensions or insurance, which have been initiated in their absence?

To what extent will you attempt to find employment for those who are displaced by returning veterans?

Disabled," free for the asking. This group also offers information on recommended practice and methods in finding jobs for the handicapped.

BEYOND THE LAW

It was gratifying to note how many companies were going beyond the letter of the law in returning servicemen to work.

The law requires the discharged serviceman to apply for his job within 90 days (amended from 40 days) of his discharge. At least one company contacted, Hercules Powder Company, extends the grace period to a year.

While the law does not require that the employer grant certain group benefits to the employee in service, at least one company has contributed employees shares of group insurance premiums during their service in the armed forces. Still another company grants two months' severance pay to all those leaving for armed service after a year's employment with the company. This is in addition to any vacation allowance which has accrued during their employment.

The firms contacted were almost unanimous in granting retroactively to returning servicemen any group benefits, such as retirement or insurance programs, which were initiated in their absence.

Neither does the law require that those who held "temporary" jobs—i. e., jobs created for a wartime exigency or jobs vacated because their original holders went into the service—be reinstated. Where a succession of jobholders left the same job for the armed forces, all of the responding companies with one exception indicated their intention to rehire all of them; the exception was a company engaged almost exclusively in munitions production.

Three-quarters of the companies intend to rehire those who left jobs created by the war. These jobs will no longer exist, of course, when military cutbacks reach large proportions, but these companies will try to find other places in their plants for former temporary workers.

DISPLACED WORKERS

A sore point in Selective Service interpretation of the law is the provision that returned veterans can displace non-veteran personnel, regardless of whether the latter have more seniority, are better qualified, or are more likable.

The point one personnel director made is that some inefficient or antisocial workers would have been fired except that their induction into the armed forces was imminent. They were sent off to the army with the blessings of the company and the fervent hope that they wouldn't try for their old job after the war. Now the company is faced with the double-edged problem of being "stuck" with the undesirable veteran and having to displace a more efficient non-veteran employee. The personnel director went on to remark that if the employee was aware of his unpopularity with his employer, it would be better for him in the long run if he sought employment elsewhere rather than force the employer—as, of course, he has the perfect right to do—to reinstate him.

But even if the veteran is a desirable and loyal worker—what of the man he displaces? Here is the problem as boiled down by the official of a large glass company:

"In devising means to solve the problem of reemploying servicemen, we must not lose sight of the fact that we have employees who have continued to work loyally and efficiently in doing the necessary and efficient jobs on the home front. It is very conceivable that some of the returning veterans will make it necessary to remove from jobs men who have had many years of service in the operating units.

"We have an obligation to them that is, in its way, as vital as our obligation to the men in service. Many men have continued to work for us when they might have gone to booming war industries and materially increased their earnings. We certainly do not want to reward this loyalty by putting them into the ranks of the unemployed, if we can possibly avoid it."

Many of the companies were confident that they could absorb the veterans with a minimum disruption of their present personnel. One pointed out the increase during the war of women workers who, it was thought, would be glad to return to domestic duties at war's end. Another company, which had experienced no great wartime expansion, felt that a return to the normal work week, voluntary retirement of older workers, and a normal number of quits would enable it to absorb its home-returning employees.

The uncertainty of postwar conditions obliged many companies to be vague concerning their plans for displaced workers. Most of them promised all reasonable aid in endeavoring to find employment for these people, and one company, at least, planned to give severance pay based on length of service to those whom they were compelled to release.

The whole problem of seniority and "superseniority" is one for the courts to elucidate. Until the interpretation is clearly defined, the only safe policy for employers to follow is to reinstate veterans, even if it means releasing other permanent employees.

DETAILS

Several companies outlined the details of their employment mechanism. While it would be repetitious to list all of them, the salient features might well be enumerated.

In at least one chemical company, a disabled veteran who is a former employee was hired as veterans' employment supervisor. The reasoning is sound that no one would be as conversant with veterans' problems as a veteran. Other companies have sent personnel men to schools offering special courses in the treatment and training of the returned serviceman.

An effort should be made to learn his activities in the armed services. His experience there might qualify him for a better job, or at any rate, the knowledge will be conducive to a more complete understanding if difficulties should arise.

Difficulties in one large rubber company are brought to the attention of an advisory Council, consisting of the Veteran Employment Committee and representatives of the labor union, the Medical, Safety, and Educational Departments. By this means all veterans are accorded fullest possible consideration.

CONCLUSIONS

Most companies are not content to obey merely the letter of the law. They feel that "within the limits of sound business judgment there is an area allowing room for the human rights as well as the legal rights" of veterans.

The president of one large company recapitulated in a circular letter to his departmental heads the ideal attitude towards the entire problem:

"The re-employment of men honorably discharged from military service is not only one of the nation's most important problems—it is the solemn moral obligation of every employer. This obligation to the men who have left their jobs; who have made financial sacrifices; who have broken up their homes; who have fought our battles can only be discharged by restoring them to their old jobs, or, if that is not possible, by striving in every possible way to provide them with jobs of equal importance and opportunity, even though under the law we are not required to do so. The men who return to us do not want charity or even sympathy—they want a chance to work and to become self-supporting. It is our duty to help them in every way we can.

"In our efforts to help them, we must give thoughtful consideration to their training, experience, and performance in military service. Many men who were engaged in relatively unimportant tasks with the company have completed difficult officer training courses; have risen in rank; and have been given positions of responsibility. Others will return physically or nervously impaired, and work which they are capable of performing must, if possible, be found for them.

"Every employing unit of the company should give careful study to the record of each returning serviceman—to his past record with the company and to his military record—and strive with the utmost conscientiousness to place him where he can best serve himself and the company."

War Developments in the Coatings Industry

by LASZLO AUER, Consulting Chemist, South Orange, N. J.

EXACTING MILITARY REQUIREMENTS HAVE SPURRED RESEARCH in protective and decorative coatings, and shortages for civilian consumption have encouraged the development of substitutes. Many of these will survive the present emergency and provide more durable materials for the postwar world.

MILITARY PROBLEMS

THE WAR effort has required from formulators of protective and decorative coatings the solution of a large number of complicated specific problems for the armed forces. To give a comprehensive survey of the various problems and specifications would take a voluminous book rather than a short survey. Therefore, as a matter of interest only, a few of the interesting problems will be discussed here.

One of the more complicated problems was to prepare coatings for cartridge cases when the Army decided to switch to steel from brass. The coating has to withstand the rigors of storage, shipping, handling, and the fiery blast inside the gun breeches. The breech temperature on firing often reaches 600° F. It is necessary that the expansion of the explosive and the following contraction should leave the coating mirror-smooth and unbroken. This problem was solved by a phenolic type baking finish. (Fig. 1.)

Another complicated problem was the finishing of food containers, which had to pass very exacting tests for corrosion and abrasion resistance. Water tanks and food cans are examples of complicated coating problems which had to be solved. Many of these coatings contain baked phenolic varnishes.

One difficulty arose when it was found necessary to unload equipment, ammunition, food, etc., in a hurry by dumping the wooden cases or cartons containing the supplies into the sea near beaches at high tide to be picked up at low tide. Food containers have to be coated with salt-water resistant coatings. At first many labels were washed off and it was impossible to know what the various cans contained, and so even the labeling has to be made salt-water resistant. The wooden boxes have to be painted with salt-water resistant paint and lined with kraft paper. The kraft paper is waterproofed with asphalt-type coatings, applied with or without volatile solvents. Laminated kraft paper, which has the waterproofing coating between two or more kraft paper sheets, is often used.

FABRIC COATINGS

The armed forces often have to live in tents, and the duck has to be treated with a mildewproof, fireproof, camouflage coating which will retain its elasticity and pliability under arctic conditions and yet not become sticky in the tropics.

Another difficulty was the shortages of raw materials which normally would have been applicable to such coatings, such as chlorinated rubber. Proof against fire was ultimately achieved by use of chlorinated paraffin as vehicle component and zinc borate and antimony oxide as pigment components. Both the chlorinated paraffin and the antimony oxide contribute to flameproofing, while the zinc borate reduces the afterglow of the material.

Camouflage netting must be coated with a similar fire-retardant paint. Some of the illustrations show the tests and effects of properly formulated fire-retardant paints for ducks and camouflage netting. (Fig. 2 and 3)

Mildewproofing was obtained by preimpregnating the textile material (with, for instance, copper naphthenate) or by incorporating proper ingredients into the paint. Various camouflage colors were needed, which would have the proper camouflage effect even when photographed with infra-red light. The selection of proper pigments required intensive research.

NAVY PAINTS

The development of a fire-retardant paint for painting the inside of ships was a navy problem. The object is that, if fire breaks out in one compartment and touches one side of a steel plate partition, the paint on the other side of the steel plate should not carry the fire into the next compartment. Low fume formation when burning, lack of fuel contribution, and good adhesion to the metal surface when exposed to fire on the other side of the steel plate are additional requirements. Adhesion to the metal surface when fire rages in a neighboring compartment is necessary in order to avoid injuries to crew members. This problem was solved with a paint having high pigment volume and high opacity, containing antimony oxide in the pigments and an alkyd resin as the binder. At later stages, when a shortage of alkyd resins occurred, a linseed oil-ester gum varnish was developed as a binder.

Another complex problem for the Navy was a non-skid deck coating for ship decks. Incorporation in the paint of a certain type of pumice stone has helped to solve this problem. (Fig. 4.)

Special ship bottom paints and other ship paints which provide proper camouflage in different oceans of the world were

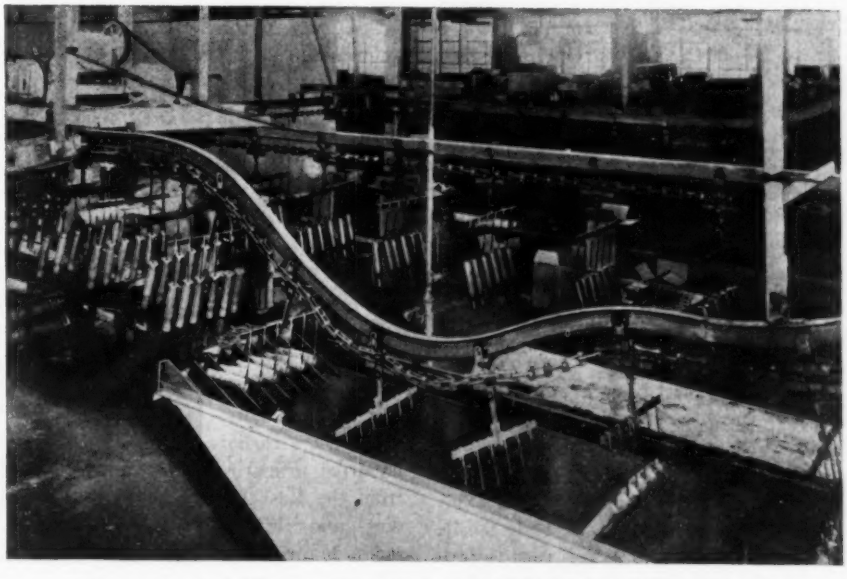


Fig. 1—Steel cartridge cases coated with a phenolic baking finish are passed over a high-voltage grid to remove excess drops of the resinous liquid.

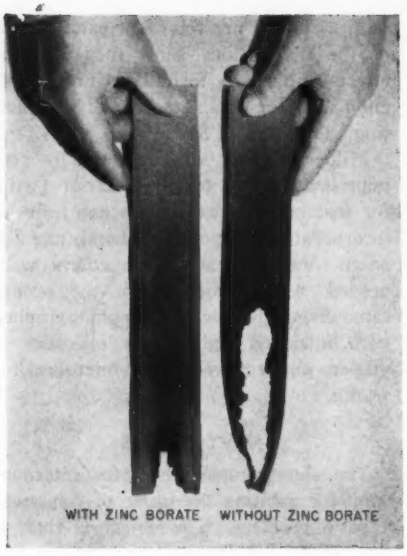


Fig. 2—A comparison of treated and untreated duck strips shows the effectiveness of fire-retardant zinc borate paints.

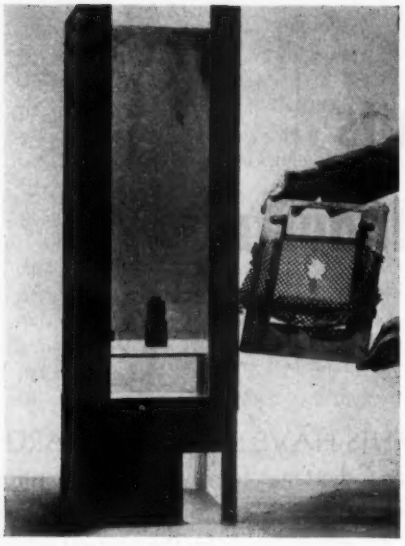


Fig. 3—A similarly treated piece of camouflage netting shows minimum damage from charring, and no afterglow.

developed, combining durability with camouflage and fungus resistance. Not only are the various oceans of different shades, but the visibility under differing climatic conditions requires different colors for camouflage.

Fungus and moisture-resistant coatings for the Signal Corps, for wire radio compasses, directional finders, and flare gun grips are just a few examples of hundreds of specific problems.

LACQUER

The lacquer industry has also had a large number of knotty problems. The finishing of parts for precision instruments is one example of investigations which lacquer formulators had to pursue.

The aircraft industry needed specialty lacquer finishes for various parts of airplanes, made of various metals. The coating of aluminum, magnesium, and magnesium alloy surfaces posed difficult questions, as did the formulation of insulation lacquers and lacquer-type cable coatings.

In one instance the Ordnance Department needed a quick-drying, lustreless lacquer enamel for exteriors of shells, bombs, grenades, etc. This material was needed in two qualities: non-infra-red reflecting and infra-red reflecting.

The vinyl resins form coatings which are lacquer-like. In one instance an Army poncho had to be waterproofed with a vinyl resin type coating, deposited from organic solvent solution. The poncho is a blanket-like cloak, with a slit in the middle for the head, made from fiber coated with a vinyl resin. (Fig. 5.)

An adhesive type coating was developed to be applied to a fabric, forming a pressure-sensitive adhesive tape. The coating of the tape is waterproof, dirtproof, acidproof, and air-resistant. This tape is a sealing agent of high tensile and adhesive strength, and is used to protect tanks and planes for overseas shipments. Containing a flexible phenolic resin, the tape covers, adheres to, and protects every opening from cannon muzzle to gas tank.

Another application of vinyl compositions is the coating of tankers and storage tanks to carry at times gasoline and sometimes fuel oil, salt, brine, etc.

A problem developed when it became necessary to ship ready-assembled fighter planes on decks of freighters. The intricate mechanism of the motor, etc., had to be properly protected. A vinyl composition was developed which is sprayed on the part to be covered and can easily be stripped off at the destination without adhesion to the paint or metal. Fig. 6 demonstrates this use.

WAR SHORTAGES

The formulators of protective coatings have had their hands full, not only as a result of the various problems they have had to solve for the Army and Navy, but also from the necessity of reformulation and again reformulation, in order to enable them to supply at least a part of civilian requirements in spite of raw material shortages.

Many sources of supply of natural raw materials have been shut off by the war, such as natural resins, which were earlier imported primarily from the East Indies and Philippines. Many edible oils and fats were also formerly obtained from Pacific sources, and drying oils have had to be diverted to food purposes to replace them. Lend-lease requirements have added to the shortages, and allocations for civilian uses have been more and more reduced.

Shortages have also been caused by the fact that many important chemicals which were regularly used for making basic materials of the coating industry have been diverted during the war to other important uses. Phthalic anhydride, for instance, which was used in making alkyd resins and phthalate plasticizers for lacquers, has been diverted to insecticide and smokeless powder manufacture. Diversion of phosphorus for war uses has lessened the availability of tricresyl phosphate and other phosphate plasticizers for the lacquer industry. The shortage in chromium has reduced the allocation of bichromates for making chromate type pigments, causing shortages in yellow and green pigments. Diversion of naphthenic acids to the making of fungus-proofing materials has caused a shortage in naphthenate driers, very popular in the paint and varnish trade.

Lack of shipping space and political considerations caused a reduction in the import of Argentine flax seed, and even the import of castor beans from Brazil presented difficulties during various stages of the war. Such shortages reduced the availability of linseed oil and dehydrated castor oil.

Ceilings for wages and products have also contributed to shortages. Gum rosin is a good example demonstrating this point. The turpentine farmers collect the oleoresin, which is a raw material for turpentine and gum rosin, in the same vicinity where new shipyards have been built and high wages paid by shipbuilders to obtain labor for their contracts, which were mostly on the cost-plus basis. The turpentine farmers cannot pay correspondingly higher wages because of ceiling prices on gum rosin.

Another cause for shortages has been

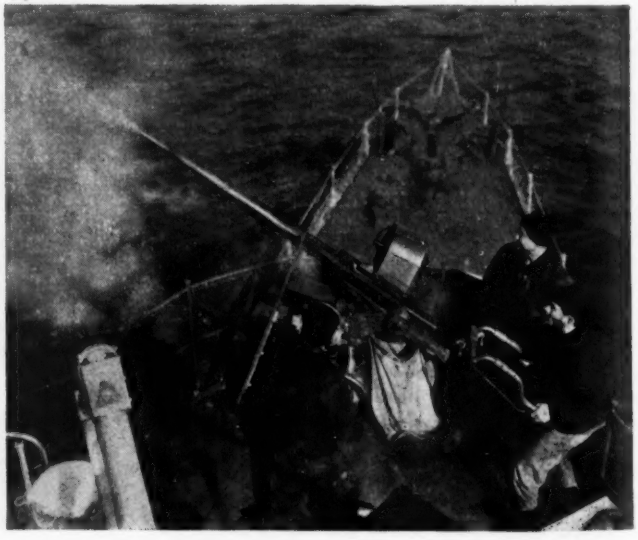


Fig. 4—Slip-proof decks with coatings containing pumice provide a safe grip at all times for sneakers or leather boots and shoes.

the diversion of entire existing equipment to the manufacture of another material which is more important to the war effort. A good example for this kind of shortage was that of phenolic and urea resins, caused by diverting formaldehyde plants to the manufacture of ammonia in the early stages of the war.

"ERSATZ" MATERIALS

Alkyd resins have suffered the earliest and most permanent lack of supply, together with phthalate and phosphate plasticizers. The alkyd resins have been replaced by oil-resin type varnishes in the paint and varnish industry and with other resins in the lacquer industry. None of the substitutes are quite satisfactory, but they have had to be used in the absence of better available materials.

Lacquer formulators have replaced the phthalate and phosphate plasticizers with products made from castor oil. Examples are double esters, where another acid esterifies the hydroxyl group of ricinoleic acid and the carboxyl group of castor oil is esterified with a monohydric alcohol. Also, sebacic acid has been made from castor oil and used in making plasticizers for lacquers and resins.

The lacquer formulator has had difficulty at various stages of the war in obtaining nitrocellulose, the entire production of which was diverted to explosive manufacture and for which, of course, no substitute was possible. The shortages of nitrocellulose, however, have always been short lived and this material soon became available. The difficulties in solvent-type plasticizers, referred to above, have been solved by satisfactory substitutes and new plasticizers which cannot be properly considered substitutes but new and worthwhile materials.

Proper solvent formulation has been the greatest difficulty encountered by the lacquer formulator. Many of the very important solvents have gone on the critical list from time to time, and it could be said that almost at any time shortages have existed which handicapped proper formulation. The solvent mixtures of lacquers are carefully planned and each ingredient has a specific role to fulfill. Leaving out any of the ingredients poses difficult problems for the formulator, and it is rather hard to find the proper replacement in most cases.

The acetate type solvents have been short, and particularly tough problems were encountered when the higher boiling acetates were not available. Comparably, the shortages of acetone and ethyl-acetate at various periods caused difficulties in obtaining proper solvent power for solvent mixtures. Lack of coal-tar hydrocarbons has given rise to grave impediments in providing proper diluent content for the solvent mixtures. Toluol has been almost unavailable, and petroleum-type diluents and aromatic hydrocarbons containing petroleum base solvents have been used as far as they have been available. The low-boiling alcohols have been obtainable most of the time except for short critical periods. Solvent shortages have been due partly to demand of the war effort, partly to lack of production facilities, but mostly to diversion of raw materials for other purposes. Amyl acetate, for example, has been used in large quantities for making penicillin.

Fig. 5—Army ponchos are waterproofed with a coating of a vinyl resin composition.

Fig. 6—A vinyl protective coating is easily stripped from painted metal airplane parts.

Even though lacquers contain, in most cases (except wood finishes), small quantities of resin, the earlier shortage of alkali resins has caused great inconvenience to lacquer formulators and manufacturers. The recent shortage in rosin-containing resins confronts the lacquer formulator, however, with an almost unsurmountable problem, especially in view of the still existing shortage of alkyd resins and lack of many natural resins.

Of the other lacquer-forming cellulose derivatives, ethyl cellulose is one of the most missed materials. Its use in cable coatings became so important that for most purposes very low allocations were made. Cellulose acetate and cellulose butyrate and acetobutyrate are specialty materials; they did not replace nitrocellulose and ethyl cellulose when the latter materials were on the critical list. Cellulose acetate was used in the airplane industry to a great extent.

OIL-RESIN VARNISHES

With regard to the raw materials for oil-resin type varnishes, the first shortage occurred in oils. Chinawood oil became scarce and unobtainable for most purposes. Dehydrated castor oil was the best replacement, and this oil became very popular in a comparatively short time. Before the war few formulators used dehydrated castor oil, but its popularity soared soon after the war broke out.

During the last few years soybean oil, which was used earlier to a great extent in paints, has been off the list of available materials for the manufacture of coatings. The worldwide need for edible fats and oils claimed soyabean oil. The other slower-drying oil, fish oil, has also been on the critical list most of the time and has been used in the manufacture of edible fats, soaps and vitamins. Only recently did fish oil again become available for the coating material industries. Fish oil, just as soyabean oil, was very popular in earlier years in the making of lower-priced architectural finishes. Soyabean oil was also an important raw material for alkyd resin manufacture.

The only oil which the varnish and paint formulator has had at his disposal all the time is linseed oil. Even though it has been available, however, only a small fraction of the demand has been allocated for civilian purposes in view of war priority demands, its use for edible purposes (lend-lease to Russia), and lack of Argentine flaxseed imports. In addition to the scarcity of linseed oil, further troubles arose when the organic treating agents, which yield fast-bodying oils, were put on the original list. Anthraquinone derivatives and maleic anhydride are examples of such materials which were no longer available for specialty linseed oils. These treated oils were originally developed to impart similarity to Chinawood oil, at least in some of its properties.

The answer was found in using more and more resins and, in general, formulating shorter oil-length varnishes for purposes where long-oil formulas were formerly used. Fatty acid pitches, sludges of fatty oil refining, and tall oil have been used to replace quota oils. At this very moment resins are less available, and tall oil is also unobtainable for most manufacturers; consequently it is impossible to meet civilian demands. Some easing of the situation is expected after Argentine seed reaches us and after the 1945 crop is collected.

RESINS

In the resins picture, formaldehyde was short for long periods and phenols were

(*Turn to page 325*)

SYNTHETIC RUBBER

From 3600 to 1,000,000 Tons per Year In Four Years

THE MATERIAL COVERED in the next few pages is a condensation of a detailed report recently issued by the Rubber Reserve Company, summarizing its activities from 1940-45. Here a detailed history is given, much of the information and data appearing for the first time, of the steps in carrying out the $700,000,000 program, and of how annual production was accelerated from a trickle of less than 4000 tons in 1942 to almost 1,000,000 tons this year.

PRODUCTION of synthetic rubbers of all types was 3599 long tons in 1942 and is expected to reach 989,000 long tons in 1945. These figures and a statement by the Rubber Reserve Co. both attest that the eventual production costs will be competitive with natural rubber at pre-war prices for a synthetic rubber, which product even now allows the production of a tire whose performance is very close to that of the pre-war natural rubber tire. The magnitude of the program is indicated by the reported capital investment of $700,000,000 and a present daily expenditure for materials, utilities, services, etc., of about $2,000,000.

As early as August, 1940, the National Defense Advisory Committee began discussions concerning synthetic rubber, resulting in the submission of preliminary engineering plans for commercial units with a total annual capacity of 100,000 tons. At the same time plans for financing the program were discussed with RFC and in October, 1940, all plans and data that had been gathered were turned over to RFC even though many of the technical questions remained unsolved. The following problems were involved:

1. The most satisfactory types of synthetic rubber.
2. The production process to be employed.
3. The availability of the necessary raw materials.
4. The quantity of critical construction materials required and the time within which the plant construction could be completed.
5. The size and location of the producing plants.

It was the view of Rubber Reserve that the best procedure was to call upon the members of private industry with experience in synthetic rubber and allied fields. As a result of numerous conferences proposals were sent out on December 5, 1940, to certain of the companies asking for the submission of definite plans for the construction of synthetic rubber plants. After further discussion the four major rubber companies on March 28, 1941, were asked to submit proposals for a program involving four plants, each having the buildings laid out for a capacity of 10,000 tons but with initial equipment for 2,500 tons.

On May 9, 1941, OPM recommended the immediate construction of plants capable of producing 40,000 tons per year. Based upon the recommendation of the rubber manufacturing industries such plants were designed to produce a butadiene-styrene-copolymer. Soon, however, technological improvements raised the designed capacity from 10,000 to 15,000 tons per year. After authorization of the 40,000 ton program fruition of further plans resulted in an increase to 400,000 tons per year in January, 1942, and after the fall of Singapore the program was gradually increased during the first half of 1942 to a total of 805,000 tons, consisting of 705,000 tons of GR-S, 60,000 tons of Butyl, and 40,000 tons of Neoprene.

BUTADIENE

As already mentioned the selection of processes was controlled to a great extent by raw material availability. This was particularly true for butadiene, the principal ingredient of the GR-S type synthetic rubber. Here the choice lay broadly between manufacture from alcohol or from petroleum derivatives.

1. Alcohol. In August, 1941, Rubber Reserve Co. authorized Carbide and Carbon Chemicals Corp. to manufacture 10,000 tons of butadiene per year from alcohol, the alcohol to be obtained from new facilities to be owned and constructed by Carbide, capable of producing 9,000,000 gals. annually. Later this was amended to double the butadiene plant capacity using alcohol from Carbide's existing facilities. As WPB later indicated the availability of 36,000,000 gals. of alcohol for 1943, the proposed butadiene plant capacity was again increased to 40,000 tons per year in February, 1942. Later estimates by WPB on May 22, 1942, indicated an allocation of 180,000,000 gals. per year for butadiene manufacture and a surplus capacity of 84,000,000. This resulted in an increase of authorizations of butadiene from alcohol to 220,000 tons per year.

The alcohol butadiene plants have attained production rates of approximately 180% of their rated capacities, requiring about 360,000,000 gallons of alcohol per year. Their operating costs, exclusive of feedstock, have been stabilized at 2.2-2.5c/lb. Yields are currently being obtained from 2.35-2.40 lbs. butadiene per gallon of 190 proof alcohol and equipment is now being installed which is expected to increase the yield to 2.50 lbs./gal. with an eventual recovery of 2.75 lbs./gal. appearing as a good possibility. At the estimated post-war industrial alcohol price range of from 15-25c/gal. delivered, butadiene would cost in the range of 8-12c/lb.

2. Butylene. The principal petroleum product used in the preparation of butadiene is butylene, also utilized in the manufacture of aviation gas. The earliest projects, January, 1942, contemplated the manufacture of butadiene by dehydrogenation of butylenes in two plants, one located at Baton Rouge, La., having an annual capacity of 15,000 tons, and the other at Baytown, Texas, having an annual capacity of 30,000 tons, utilizing a process developed by the Standard Oil Development Co. The butylenes utilized were to be made available from the operations of an adjacent refinery. In addition two privately owned plants were either being operated or completed by the Standard Oil Co. of La., at Baton Rouge, La., with a combined capacity of about 9,100 tons per year. Butylenes were not employed as starting materials here. Still another plant authorization was for the preparation of butadiene from butylenes in connection with the refinery of the Shell Oil Corporation at Los Angeles, Cal.

Because of the limited availability of

butylenes it became necessary to consider the construction of facilities to produce butylenes from butane, available at various refinery locations in the Southwest and near Chicago. Three such plants were proposed, simultaneously, one for Sinclair Rubber, Inc., in the Houston area, one for Neches Butane Products Co., and one in the Chicago area to be operated by Rubber Synthetics, Inc.

The Chicago plant was authorized in March, 1942, but in August, 1942, was cancelled.

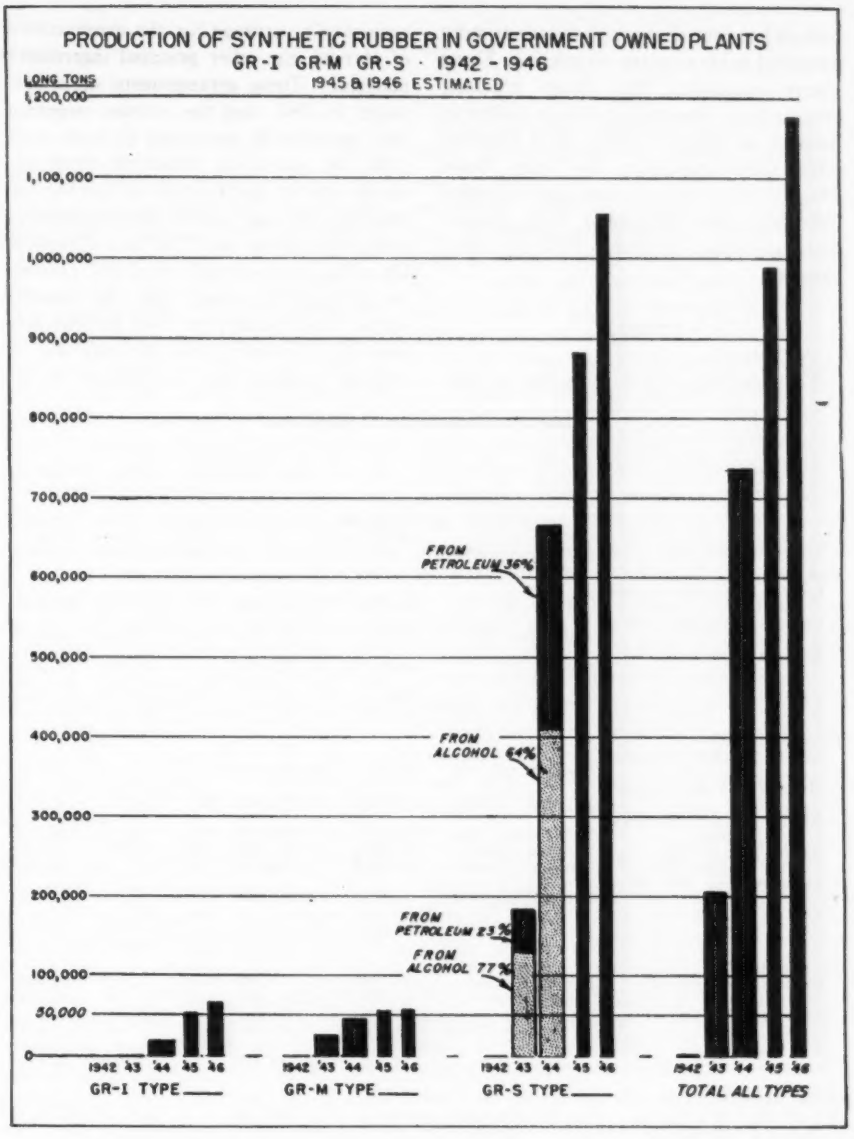
The preparation of butadiene from butylenes utilizes a process developed by Standard Oil Company of N. J. These plants have performed, for the most part, in a satisfactory manner, in one case reaching a rate of 125% of design.

Operation of the larger butylene dehydrogenation plants has not yet been sufficiently stabilized to establish their potential operating costs. One of the plants, however, has reported butadiene costs of less than 7.0¢/lb. for several individual months. It is estimated that the average operating cost of these plants, exclusive of feedstock, will settle down at a level of approximately 4.0¢/lb. within the next few months. Butylene is currently being purchased at prices ranging from 8-12¢/gal., and yields of sixty to seventy per cent are now being obtained. It is believed reasonable that post-war prices for butylene will be in the neighborhood of 6-8¢/gal. Based on these assumptions the cost of producing butadiene should be approximately 6.0-7.0¢/lb.

3. Butane. Another possible method was the direct production of butadiene from butane. One of the earlier authorizations, January 1942, contemplated a plant at Borger, Tex., using this means. Its design capacity was 45,000 tons per year although it has never reached a rate of more than 55%, partially due to lack of feedstock.

In August, 1942, the Sun Oil Co. was authorized to convert its facilities at Toledo, Ohio (projected capacity, 15,000 tons a year). This conversion involved utilization of the Houdry process for the manufacture of butadiene from butane. In October, 1942, the Standard Oil Co. of Calif. was authorized to construct a Houdry plant of like capacity at El Segundo, Calif., to produce low purity butadiene. Other Houdry plants were authorized but later cancelled as it was the judgment of Rubber Reserve Co. that this process, although interesting, had not been tested sufficiently. After initial operating difficulties operations at Toledo have reached approximately 50% of design while those at El Segundo have reached 70-80% of rating. Further plant additions are expected to increase this figure.

The prediction of ultimate operating costs of the Government plants producing butadiene from butane is difficult, owing to unsteady operation resulting from technical difficulties that have been experienced. There are indications, however, that these plants may be able to produce butadiene competitively with the butylene dehydrogenation plants.



4. Naphtha. Early in 1942 Rubber Reserve Co. was notified that an oversupply of naphtha and stove oil existed in Southern California. Certain facilities owned by Southern California Gas Co., normally used only as stand-by gas facilities were available and suitable for the preparation of a butadiene fraction by the steam cracking of naphtha or stove oil. Conversion of these gas generators to the manufacture of a butadiene fraction and other materials usable in the aviation gasoline program was authorized in April, 1942. This conversion also contemplated production of substantial quantities of fuel gas. After some initial delays, this project is operating satisfactorily and is expected to be producing at close to rated capacity in the near future.

The processes based on naphtha feedstock give a relatively low yield of butadiene (approximately 3 to 4 per cent). The ability of these plants to be competitive with others in the program will depend upon the availability and cost of feedstock, as well as the recovery and sale of the many materials produced as by-products in the cracking operations.

5. Refinery Conversions. Discussions regarding the production of butadiene by conversion of existing refinery facilities took place as early as May, 1942. Rubber Reserve Co. favored such conversion to the extent that it might provide butadiene quickly during the latter months of 1942 and early months of 1943, at which time butadiene shortage was expected to be most acute. The Atlas Oil and Refining Co. was authorized in June, 1942, to convert its existing refinery at Shreveport, La.; expected capacity, 8,300 tons per year. In August, 1942, the Standard Oil Co. of La. was likewise authorized to convert certain existing facilities at Baton Rouge, La.; projected capacity, 6,860 tons per year.

Many other refinery conversion projects were authorized during the latter part of 1942 and the early part of 1943 to meet the expected shortage of butadiene at that time. Later it became apparent that some of the projects could not be completed in time to accomplish the objective

and all but four of the authorizations were cancelled prior to plant completion. Those plants employing the steam cracking process have demonstrated their ability to produce at approximately rated capacity while those employing the True Vapor Phase (TVP) process have had corrosion difficulties, the El Dorado, Ark., project now operating at about 50% of rated capacity.

STYRENE

To meet the GR-S program it was necessary to arrange for the manufacture of styrene, the other principal ingredient material. These arrangements were initiated in 1941, and the styrene program was successively expanded to keep pace with the increased butadiene program. At the date of the inception of the styrene program the only commercial producer of synthetic styrene was The Dow Chemical Co. which had manufactured this product on a relatively small scale for several years. In February of 1942 Rubber Reserve Co. contracted for the purchase of styrene produced in an addition to its privately-owned plant to be constructed and located at Midland, Michigan, the entire plant with its additions having a productive capacity of approximately 12,000 tons per year. In March, 1942, Rubber Reserve authorized Dow to construct two government-owned styrene plants, one to be located at the Los Angeles area having a productive capacity of 25,000 tons per year, and one to be located at Velasco, Texas, having a productive capacity of 37,500 tons per year, which was increased to 50,000 tons the following month, employing the Dow process.

To obtain diversification in processes and to furnish a greater degree of operating protection in this relatively new field, Rubber Reserve Co. entered into a similar contract in August, 1941, with Carbide and Carbon Chemicals Corp. for the purchase of 4,300 tons per year of styrene to be produced by its own process in a privately-owned plant to be constructed and located at South Charleston, W. Va. In December, 1941, this arrangement was changed to provide for the construction as a government-owned project at Institute, W. Va., adjacent to the government-owned butadiene and copolymer plants, completing an integrated project. At the same time the capacity of the styrene plant was increased to 12,500 tons per year. In March, 1942, this capacity was increased to 25,000 tons per year.

For the same reasons of process diversification Rubber Reserve Co. issued an authorization in August, 1941, to Monsanto Chemical Co. providing for the construction of a government-owned styrene plant at Texas City, Texas, having a productive capacity of 6,400 tons per year, which, by successive increases through August of 1942, became 50,000 tons per year, such plant employing a process developed by Monsanto and others. At the time of the last increase in capacity a portion of the Dow process was installed to be operated in conjunction with a part of the existing facilities.

As previously mentioned the original authorization issued to Koppers for the construction of a butadiene plant at Kobuta, Pennsylvania, also included an authorization for the construction of an integrated styrene plant which had a projected capacity of 37,500 tons per year. The design of this styrene plant involved in part the process developed by Dow, and in part a process developed by Koppers.

The other ingredient necessary for the manufacture of styrene in addition to benzene is ethylene. Since ethylene was available only in limited quantities, it became necessary to provide for the manufacture of ethylene from ethyl alcohol as an integral part of the styrene plants located at Los Angeles and Kobuta. Plans have now been developed for the installation of facilities at both locations

Plants for Preparation of Butadiene

Name of Company	Location of Plant	Rated Cap. Short Tons /Yr.	Estimated Plant Investment $	Estimated Plant Investment $ Per Annual Ton of Prod.	Actual Production 1943 Short Tons	Actual Production 1944 Short Ton
From Alcohol						
Carbide & Carbon Chemicals Corp. (4 units)	Institute, W. Va.	80,000	39,000,000	271[2]	77,465	140,990
Carbide & Carbon Chemicals Corp. (3 units)	Louisville, Ky.	60,000	35,500,000	329[2]	25,531	94,053
Koppers Company, Inc. (4 units)	Kobuta, Pa.	80,000	41,000,000	285[2]	26,689	126,691
		220,000	115,500,000	292	129,685	361,734
From Butylenes						
Cities Service Refining Co.	Lake Charles, La.	55,000	17,100,000	311	0	6,596
Humble Oil & Refining Co.	Baytown, Texas	30,000	19,000,000	507[7]	6,208	29,495
Neches Butane Products Co.[4] (2 units)	Port Neches, Tex.	100,000	59,500,000	595	0	48,338
Shell Union Oil Co.	Torrance, Calif.	55,000[5]	21,000,000	627[5]	1,675	30,917
Sinclair Rubber, Inc.	Houston, Texas	50,000	31,500,000	504[7]	0	19,096
Standard Oil Co. of N. J.	Baton Rouge, La.	15,000	9,600,000	512[7]	11,544[8]	17,797
		305,000	157,700,000	...	19,427	152,239
From Butane						
Phillips Petroleum Co.	Borger, Texas	45,000	35,200,000	782	3,930	23,274
Sun Oil Co.	Toledo, Ohio	15,000	7,500,000	500	30	2,451[10]
Standard Oil Co. of Calif.	El Segundo, Calif.	15,000	7,600,000	507	0	3,972[12]
		75,000	50,300,000	...	3,960	29,697
From Naphtha						
Southern Calif. Gas Co.	Los Angeles, Calif.	(30,000)[5]	13,500,000	...[6]	(2,225)[6]	(19,547)[6]
Standard Oil Co. of N. J.	Baton Rouge, La.	10,000	2,000,000	430[9]	3,429	6,998
Humble Oil & Refining Co.	Ingleside, Texas	12,500[11]	4,100,000	480[11]	971	6,785
Lion Oil Refining Co.	El Dorado, Ark.	(4,000)[9]	2,300,000	...[9]	(281)[5]	(2,600)[6]
Taylor Refining Co.	Corpus Christi, Tex.	(5,500)[11]	1,900,000	...[11]	0	(266)[6]
		22,500	23,800,000	...	4,400	13,783
Total		622,500	347,300,000	...	154,472	557,453

Recapitulation (In short tons)	Rated Capacity	Demonstrated Operating Capacity	1943 Production	1944 Production
Alcohol Plants	220,000	396,000	129,685	361,734
Petroleum Plants	402,500	426,250	27,787	195,719
	622,500	822,250	157,472	557,453

Notes:

[1] Plant investment includes contemplated expenditures for changes and improvements. Investment includes funds for extensive utility facilities at some projects, while other projects obtain utilities from outside sources.

[2] Based on demonstrated production capacity of 180% of rating.

[3] 40,000 tons/yr. originally benzene feedstock; change to alcohol 7-25-42.

[4] Comprised of the following: Atlantic Refining Co., Gulf Oil Co., Pure Oil Co., Socony-Vacuum Oil Co., and The Texas Co.

[5] The Shell project consists of a 55,000 ton purification plant and a 25,000 ton production unit. The purification plant handles crude material produced by Southern California Gas Co. The plant investment figures are combined in arriving at unit investment value.

[6] Crude butadiene excluded from totals: purified elsewhere.

[7] Based on demonstrated production capacity of 125% of rating.

[8] Includes production from pilot plant which was part of this project. Pilot plant started 3-26-43. Pilot work was completed and pilot plant shut down 12-11-43.

[9] Standard Oil Co. of New Jersey purification plant has been expanded to handle crude material produced by Lion. The two plant investment figures are combined in arriving at a unit investment value. The Lion plant was originally authorized to produce 6,700 tons butadiene in crude form. Effective 4-12-44, rated capacity was reduced from 6,700 tons to 4,000 tons. (Further reduction to 3,500 tons under discussion.)

[10] The Sun plant, starting 11-29-43, made 30 tons of butadiene and was shut down for extensive changes. Operations were resumed 6-30-44. In addition to the above, 474 tons of low purity butadiene were produced and purified elsewhere.

[11] The Ingleside project consists of a 12,500 ton purification plant and a 7,000 ton production unit. The purification plant handles crude material produced by Taylor. The two plant investment figures are combined in arriving at a unit investment value.

[12] Production figures exclude material produced by repurification of Copolymer plant recycle.

[13] Plant started producing low purity butadiene on 1-9-44. Production of this material totalled 973 tons which was further purified elsewhere and hence excluded from the totals. Specification product was made starting 4-21-44.

[14] GR-S equivalent—771,900 long tons.

providing for the recovery of ethylene from gases produced in related butadiene plants. With the exception of the quantity of ethylene which is produced from propane (derived from natural gas) at Texas City all other ethylene requirements for the styrene program are supplied by Carbide and Carbon Chemicals Corp. from facilities located at its near-by Texas City and South Charleston plants, which ethylene is delivered to Rubber Reserve Co. in lieu of equivalent quantities of ethyl alcohol. All of such ethylene is delivered by pipeline.

Since their completion, operation of the styrene plants in the program has been satisfactory and substantially free from operational difficulties. An average over-capacity of approximately 50% has been demonstrated for the production of ethylbenzene, the intermediate product from which styrene is produced, which has also been produced in large quantity for the aviation gas program. The finishing sections of the plants have not yet operated at the same high rate of capacity, but with relatively small additions, including in some cases additional steam and cooling water facilities, it is expected that an average over-capacity of 50% will be attained.

The cost of the styrene produced is largely a function of the prices of the two principal feedstocks, benzene and ethylene. At present, with benzene at about 16¢/gal. and ethylene purchased at 6¢/lb., styrene costs of 6-7¢/lb. are being obtained. Two plants are producing their own ethylene by the dehydration of alcohol, which results in substantially higher cost for ethylene and increases the cost of styrene to 12-14¢/lb. In post-war operation it has been estimated that ethylene will be available at approximately 3¢/lb., and benzene at 8-12¢/gal. Based on these prices it should be possible to produce styrene for an out-of-pocket cost of 4-5¢/lb.

POLYMER PLANTS

The various cost analyses are based on plant costs, exclusive of Washington administrative expense, interest, research expense, plant amortization and sales expense. As the plants are operated for the government by private companies, a charge has been included in most cases to cover home office management expense. Allowance has been made for the payment of royalties at rates which are lower during the war period than they will be post-war.

GR-S (Butadiene-Styrene). It was believed that the original copolymer plants should be constructed and operated by the rubber companies with the greatest amount of experience in the field. Rubber Reserve Co. decided that of the earliest copolymer plants in the program two should be located at Akron, Ohio, and operated by Goodyear Tire & Rubber Co. and Firestone Tire & Rubber Co., one should be located at Naugatuck, Conn., and operated by United States Rubber Co., and one should be located at Louisville, Ky., and operated by Hycar Chemical Co. (The latter plant was later assigned to the B. F. Goodrich Co. for operation in pursuance of arrangements made between Hycar Chemical Co. and its two parent companies.) These locations were selected primarily out of consideration for their proximity to existing pilot plants and technical laboratories, as well as their proximity to the large manufacturing facilities and company personnel. Also, the locations were within the principal rubber-consuming areas of the country. In December 1941 these plants, which were originally designed for a capacity of 10,000 tons per year and later rated at 15,000 tons per year, were doubled to a capacity of 30,000 tons each.

When the GR-S program was increased above a total of 120,000 tons per year it became necessary to select locations for additional copolymer plants. The four original plants, although similar in design, reflected certain differences in process equipment as a result of each operating company's having followed the results of its own experimental work. In order to minimize time and expedite the ordering of necessary materials and equipment, to assure most rapid completion of the considerable number of copolymer plants then added to the program, and to obtain a uniform grade of rubber, it was decided to standardize the plant design. As a result, with only two exceptions (where one portion of each plant was of different design), the remaining copolymer plants in the program were built according to standard design and specifications. Standardization accomplished the desired purpose of accelerating the fabrication of materials and the completion of construction and, at the same time, provided needed flexibility in shipping materials between plant locations to facilitate the close scheduling of plant completions, which was necessary to provide an integrated program. In selecting locations for the remaining copolymer plants primary attention was given to their proximity to supplies of butadiene and styrene and the problems of transporting such supplies. In order to divide the responsibility for constructing and operating the copolymer plants among the four companies originally selected for that purpose, approximately equal plant capacity was assigned to each.

With the view that a great number of

Cancelled Projects

Name of Company	*Location of Plant*	*Type of Plant*	*Rated Capacity Tons per year*	*Estimated Investment or Liability $*	*Remarks*
Part A—Projects Authorized and Cancelled by Rubber Reserve Company					
Standard Oil Co. of New Jersey	Bayway, N. J.	Butadiene	45,000	23,000	Liability includes charges applicable to toluene and aviation gasoline projects.
Richfield Oil Corp.	Los Angeles, Calif.	Butadiene	30,000	5,000	
Rubber Synthetics, Inc.	Gary, Ind.	Butadiene	100,000	1,488,000	Liability includes total purchase price of land owned. See note below.
East Texas Petroleum Derivatives	Longview, Texas	Butadiene	28,000	4,600	Engineering study.
Dow Chemical Co.	Gary, Ind.	Styrene	37,500	234,000	See under butadiene from butylene.
Phillips Petroleum Co.	Borger, Texas	Styrene	15,000	95,000	For plant engineering and design data.
Carbide & Carbon Chemicals Corp.	South Charleston, W. Va.	Styrene	4,300	23,000	Private construction replaced by government plant of increased size constructed at Institute.
Firestone Tire & Rubber Co.	Los Angeles, Calif.	Copolymer	60,000	6,300	Inter-changed with Goodyear at Port Neches 8-5-42.
Goodyear Synthetic Rubber Corp.	Port Neches, Texas	Copolymer	60,000	11,600	Inter-changed with Firestone at Los Angeles 8-5-42.
Firestone Tire & Rubber Co.	Gary, Indiana	Copolymer	120,000	8,700	See under butadiene from butylene.
U. S. Rubber Co.	Gary, Indiana	Copolymer	75,000	6,700	See under butadiene from butylene.
Atlas Oil & Refining Corp.	Shreveport, La.	Butadiene	8,300	181,000	Private construction. Contract cancelled due to lateness of completion.
Pacific Gas & Electric Co.	San Francisco, Calif.	Butadiene	20,000	3,700	Project cancelled due to distant location of existing facilities from purification plant.
E. I. du Pont de Nemours & Co.	Deepwater, N. J.	Thiokol	20,000	345,000	Private facilities; reconverted to other war use. Thiokol program was suspended 3-25-43. Liability consists of conversion and reconversion costs plus loss on government-owned dryer.
Dow Chemical Co.	Velasco, Texas	Thiokol	33,000	2,700,000	Completion of project suspended when the Thiokol program was suspended 3-25-43.
Part B—Projects Authorized and Cancelled at the Request of Rubber Director					
Standard Oil Co. of Indiana	Wood River, Ill.	Butadiene	45,000	191,000	
Magnolia Petroleum Co.	Beaumont, Texas	Butadiene	15,000	19,500	
Pan-American Refining Corp.	Texas City, Texas	Butadiene	10,000	30,000	
Arkansas Fuel Oil Co.	Bossier City, La.	Butadiene	15,000	50,000	
Ohio Oil Company	Robinson, Ill.	Butadiene	3,600	17,500	
Southport Petroleum Co.	Texas City, Texas	Butadiene	18,000	443,000	
Hancock Oil Company	Los Angeles, Calif.	Butadiene	15,000	7,700	
Eastern States Petroleum Co.	Houston, Texas	Butadiene	12,800	3,750,000	Includes conversion and reconversion expense.

companies should be encouraged to conduct work in the synthetic rubber field and to make a wider contribution to the development of synthetic rubber production in this country, it was deemed desirable that groups of rubber manufacturing companies should be organized to operate three of the copolymer plants, each plant having a rated capacity of 30,000 tons per year and designed and constructed under the supervision of one of the four original operating companies.

Such groups were organized along purely voluntary lines, and Rubber Reserve Co. arranged for the group companies to receive technical information from the five original companies in the copolymer field and for participation in the exchange of technical information under the related patent interchange agreement. The operating personnel of each of the group companies received intensive preliminary training from the four original operating companies in existing copolymer plants, thus making it possible for such group companies to assume the operation of the plants assigned to them within a comparatively short time after the completion and initial operation.

Capacity has always existed in the copolymer plants to convert all available butadiene and styrene into rubber. Operating difficulties have been minor, and much improvement has been made. Most of the plants have demonstrated their ability to operate at 120% to 130% of rating. Rubber production during 1944 was limited through June by the supply of butadiene, and since June by the inability of the rubber fabricating plants to consume additional material.

There are three factors which must be considered in arriving at the cost of producing GR-S, namely the cost of butadiene, the cost of styrene, and the cost of converting these two principal raw materials into GR-S. The cost of producing butadiene and styrene varies widely, depending upon the feedstock, but during 1944 has averaged approximately 33c and 10c/lb., respectively. Conversion costs are fairly uniform, owing to the similarity in design of the copolymerization plants, and are currently being reported in the neighborhood of 4.9¢/lb. of synthetic rubber. Thus the present average cost of producing GR-S is 30¢ to 31¢/lb.

In the table below the cost of producing GR-S under various conditions is set forth. The costs are presented on the basis discussed in the opening paragraph of this section, and are all expressed in cents per pound of GR-S product. The present average cost of production is shown. In addition, there is presented the approximate cost of producing GR-S at a project which is supplied exclusively with butadiene and styrene manufactured from petroleum feedstocks. Costs in the range of 11¢ to 12¢/lb. are regularly obtained at this project. Estimated post-war GR-S costs have been built up based on the same cost elements which are included in the current figures and based on certain assumptions which are discussed in the following lines. In developing these post-war estimates, the present conversion cost of approximately 5.0¢/lb. has been reduced to 4.5¢ lb. to allow for improved general operating efficiency and an expected reduction in the cost of chemicals. Styrene has been included in the estimates at a uniform value of 5.0¢/lb. Butadiene has been included on the basis of (1) its production from alcohol, (2) its production from butylene; and subdivisions have been added to indicate the variation of cost with the price of the primary raw material.

Cost of Producing GR-S Under Various Conditions

Note: All costs expressed in ¢/lb. of GR-S product, excluding amortization

	Cost of Butadiene	*Cost of Styrene*	*Cost of Conversion*	*Total Cost*
1. Present Average Cost—All Plants	23.5	2.2	5.0	30.7
2. Present Cost at Lowest-Cost Project	4.9	1.4	4.6	10.9
3. Possible Post-War Cost Using Alcohol as Source for Butadiene (assuming use of styrene costing 5.0¢/lb.)				
Alcohol				
@ 90¢/gal. (delivered)	26.2	1.1	4.5	31.8
@ 50¢/gal. (delivered)	15.2	1.1	4.5	20.8
@ 30¢/gal. (delivered)	9.8	1.1	4.5	15.4
@ 25¢/gal. (delivered)	8.5	1.1	4.5	14.1
@ 20¢/gal. (delivered)	7.2	1.1	4.5	12.8
@ 15¢/gal. (delivered)	5.8	1.1	4.5	11.4
4. Possible Post-War Cost Using Butylenes as Source for Butadiene (assuming use of styrene costing 5.0¢/lb.)				
Butylene				
@ 10¢/gal.	5.1	1.1	4.5	10.7
@ 8¢/gal.	4.6	1.1	4.5	10.2
@ 6¢/gal.	4.2	1.1	4.5	9.8
@ 4¢/gal.	3.8	1.1	4.5	9.4

Estimates of post-war prices for butylene and for industrial alcohol are subject to controversy. However, assuming that butylene can be purchased for 6¢ to 8¢/gal. as a raw material for butadiene, it is estimated that GR-S can be produced for a cost of approximately 10¢/lb. Likewise, assuming that industrial alcohol prices to the synthetic rubber industry will be in the range of 15¢ to 25¢/gal., it is estimated that GR-S can be produced therefrom for a cost of 11¢ to 14¢/lb.

2. GR-M (Neoprene). Before the war, the E. I. du Pont de Nemours and Co. had developed and produced its own synthetic rubber called "Neoprene." Because of the special characteristics of Neoprene as an oil- and chemical-resistant rubber it was necessary that the government's program include expanded Neoprene capacity in order to meet the demands of the war program. Du Pont, on its own initiative, had already begun the construction of a new Neoprene plant at Louisville, Ky., having an original designed capacity of 10,000 tons per year but engineered to permit expansion. The estimated needs of the war program indicated that a total additional Neoprene capacity of 40,000 tons should be provided, and the Louisville location already selected by du Pont for its 10,000-ton unit was considered to be most suitable from the standpoint of the availability of raw materials, construction forces already on the site, integration with utilities and other general facilities already at such location, and the necessity of making fullest use of du Pont's technical personnel. The size of the expansion required government financing, and, as it was impracticable to separate integrated facilities, the government took over du Pont's investment in the facilities then in the course of construction and arranged for their expansion into a 40,000-ton government-owned plants. These units came into production approximately on schedule, and have operated in a highly satisfactory manner. An expansion of the facilities is under construction which, when taking into account the demonstrated capacity of the existing units to produce at approximately 120% of rating, will increase the total Neoprene capacity from 40,000 to 60,000 tons per year.

The principal element in the cost of producing GR-M is the price paid for acetylene. Using present acetylene prices of 11.5¢ to 12.0¢/lb., GR-M is being produced at a cost of 23¢ to 24¢/lb. Based on a probable post-war acetylene price of 6¢ to 7¢/lb., it is reasonable to expect that GR-M may be produced for cost in the neighborhood of 19¢/lb.

3. GR-I (Butyl). Butyl rubber is manufactured from isobutylene and isoprene and is known to have qualities more suitable than other known rubber substitutes for the manufacture of tubes, barrage balloons, and other pneumatic rubber products needed in the war program. Standard Oil Company of La. (an affiliate of Standard Oil Development Co.) had already begun the construction of a privately-owned Butyl rubber plant located at Baton Rouge, La., having a designed capacity of approximately 7,000 tons per year. For reasons similar to those in the case of Neoprene it was deemed advisable in February, 1942, that the government take over this private plant and expand it to 40,000 tons per year. In order to provide greater quantities of Butyl rubber for the program a second authorization was issued to Humble Oil and Refining Co. (likewise an affiliate of Standard Oil Development Co.) to construct a Butyl rubber plant adjacent to its refinery at Baytown,

(*Turn to page 357*)

How To Organize a SALES CONTROL SYSTEM

By R. L. CAIN
Pennsylvania Salt Manufacturing Company
Philadelphia, Pennsylvania

AFTER DISCUSSING LAST MONTH the importance and place of sales control in the chemical marketing organization, Mr. Cain now gets down to the brass tacks of how to do it. Here is a basic pattern for a chemical sales control system that has survived both the fire of long use and the critical study of experts.

THE SALES departments of no two chemical companies are exactly alike; nor do any two operate the same. It is therefore impractical to suggest a specific sales control system which will work well in all chemical companies. Organizing a sales control system is a tailor-made job, but there are several fundamentals which must be present in any sales control system and it is to set forth these basic principles that this article has been written.

A common fault with many proposed sales control systems is that the sponsor represents the system as a grand cure-all of business ills. It is likened unto a magic wand which the sales manager has but to wave in order to make everything all right. Sales control is not a cure-all, but properly established, maintained, and supported, it will cure many common sales department ills, and, more important, it will be an excellent preventive.

The selection of the Sales Control Manager is the first step in organizing a sales control system. He should be carefully chosen. He ought to be a man who has spent not fewer than five pre-war years "on the road." Strange though it may seem, it is not necessary that he should have had a top sales record while operating as a field representative. It is more important that he be a man who has shown a flare for detail in one way or another. Perhaps he didn't even like the job of calling on customers and prospects, but, whether he liked it or not, he must have done it over a period of a few years at the least. This experience is a prerequisite of the first order.

In addition to possessing these qualifications, the man for this job should register a satisfactory score when put through the usual examination for any executive sales position. The Sales Control Manager's place on the average sales department organization chart is that of assistant (perhaps one of two or more) general sales manager or assistant to the vice president in charge of sales.

The second step in organizing a sales control system is for the newly selected Manager to make a thorough study of as many operating sales control systems in other companies as possible. As the Sales Control Manager observes each step in the operation of other sales control systems, he should continually ask himself, "How will this step work in our company?" A consolidation of the positive answers and an elimination of the negatives at the close of the observation period should then be accomplished.

As the third step, the Sales Control Manager should design his own system—a custom-made affair exclusively for his own company.

The good sales control system is made up of four major phases: (I) sales service to the field staff, (II) sales follow-up, (III) sales statistics and (IV) sales analysis. It is a service department, pure and simple, and must be run as such.

I - SALES SERVICE TO THE FIELD STAFF

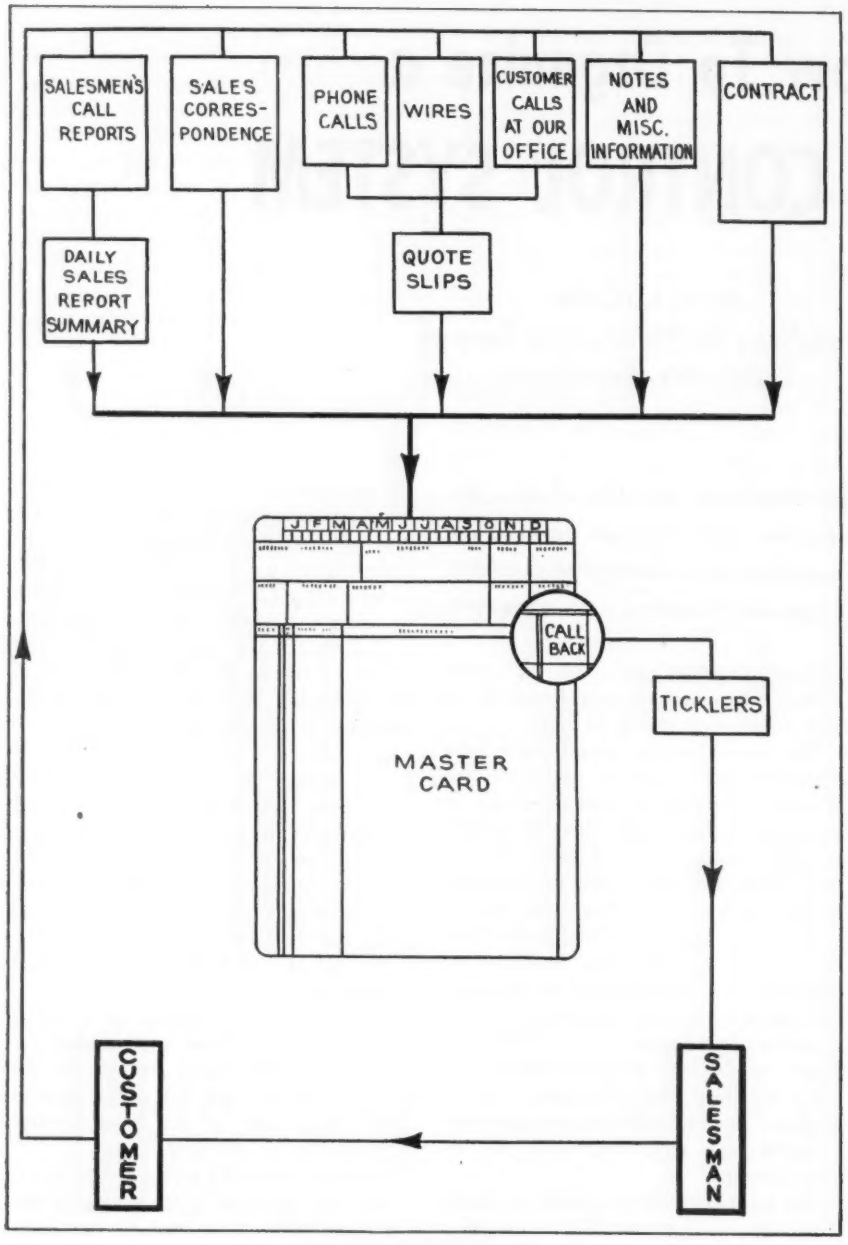
CONSTANT rendering of service to the field staff is an important phase of sales control. For a sales department of up to thirty-five field representatives, one clerk with executive supervision and assistance for the Sales Control Manager will satisfactorily handle this assignment. A second clerk is needed for companies having more than thirty-five field men.

The salesman's first duty is out in the field calling on prospects and customers. However, a careful analysis shows that this outside man has many other responsibilities of an inside nature. Throughout the entire cycle of selling merchandise, the salesman carries a share of the ultimate responsibility for smooth operation and satisfactory completion. Since he cannot spend too much time in the office looking after his "inside" responsibilities, he needs an assistant—an inside assistant.

This then is the real duty of the Sales Service Unit—to provide an assistant to the salesman. If it is to function satisfactorily, it must be the salesman's eyes, ears, voice, and the true interpreter of his thoughts. This unit has no identity of its own because it is always handling the responsibility of the salesman. Therefore, the unit must think and act as the salesman would were he present to carry on the activity himself. The successful Sales Service Unit will never allow itself to become blinded to the primary task of serving the field staff.

The following are among the common services which the Sales Service Unit performs, the detail being handled by the clerk in charge and the administrative work being done by the Sales Control Manager or his assistant:

1. Know where the salesmen are. Salesmen are provided with weekly Route Sheets which they mail to the Sales Service Unit for arrival each Monday morning. On these sheets the salesmen list the cities and hotels where they will be every day that week. If they get off schedule, they wire or phone the Service Unit to correct the sheet.
2. Let the salesmen know that the Service Unit is following their itinerary closely. A daily envelope is prepared for each salesman each morning and the general mailing department is instructed to route all salesmen's mail to the Service Unit from where the mail is dispatched to the salesmen every afternoon. Air mail and Special Delivery are used freely. Transit times are carefully worked out.
3. Take care of telephone calls, letters, telegrams, and visitors for the salesmen while they are away from the office.
4. Keep the salesmen advised of all orders received at the office from within their territories. This is accomplished by sending the men copies of orders



Sales control flow sheet

received from their customers. Subsequently, the salesmen also receive a copy of each invoice covering a shipment into their territories.

5. Inform the salesmen of all that goes on between the office and their customers during their absence. This is done by sending the men copies of letters written to their customers, and, if necessary, copies of their customers' letters. Phone calls and other contacts of whatsoever nature are likewise promptly reported.

6. Keep the salesmen informed up to the minute about price changes and stock positions of all products.

7. Tell the salesmen where their neighboring field representatives are (especially when their routes are about to cross) and what they are doing and how they are getting along.

8. See that the salesmen's expense and salary checks are "kept rolling."

9. See that the salesmen's cars are maintained in good condition by expediting requests for company authorizations for new tires, repairs, car servicing, trade-ins, etc., etc.

10. Keep the salesmen advised of all developments of general interest within the company, within the industry, and throughout the other industries important to their work.

11. Be ready to perform liaison duties for the salesmen not only within the sales department but throughout the entire company.

12. Always have time to listen to the salesmen's troubles and to help them whenever they need help.

13. Give the salesmen's good work maximum publicity. Help them overcome and correct unsatisfactory work.

14. Strive to improve the inside sales personnel's understanding of the salesmen's lot.

15. Encourage the Sales Manager and other company executives to send a weekly letter to the field staff in which interesting sales activities and developments or other relevant subjects are reviewed.

II - SALES FOLLOW-UP

THE Sales Follow-Up System which we speak about in this article is designed for use in a chemical company where the majority of the field staff operates directly out of the home office although from different divisions of the company in that office. This system could equally well be introduced into sales departments where the field staff is broken down into districts each of which has its own office and district sales manager; but here a decision would have to be made as to how much duplication of records in district office and home office is practical and necessary. Or, with slight modification, this system can be used in a department where there are controls from both home office and field office. Regardless of what the setup is, there are certain basic points that remain constant in the successful Sales Follow-Up System, and it is these points with which we are primarily concerned here.

Chemical abstracts have long performed a great service to scientific men, and our Sales Follow-Up System is built around the plan of abstracts.

THE CALL REPORT

The salesman interviews a customer or prospect and reports his interview on his Call Report Form. There are so many variations of this important form that it is hardly worth while to try to select one that is representative. The form must be made to fit the specific needs of each company. However, it must be remembered that the filling out of this form will require a substantial part of the salesmen's time. Therefore, it must be kept as brief and as simple as possible. Yet it is such an important form that one cannot afford to omit basic, pertinent data even for the sake of brevity. Much forethought should be given to the design of the Call Report Form.

In one sense, anything and everything that can be found out about customers and prospects is helpful to selling, but to record it all is impracticable in a sales control system. Therefore, the necessary basic data must be separated from the vast amount of other data which is of only secondary importance.

At the head of the specimen Call Report Form referred to herein the salesman shows what division of his company he works for, i. e., "Heavy Chemicals (HC)"; "Specialties (Sp)"; "Agricultural Chemicals (A)," etc. He lists his own name and the date of call. He designates whether the call was made on a customer or prospect. He makes a check

mark if his call is to be followed up by a letter. He marks whether a sample is to be sent and he indicates the approximate date he wishes to call back.

Next, he fills in the name and the complete address of the company on which he called and he lists the name and title of each individual he talked with or learned something about during the interview. He names the industry to which his prospect or customer belongs (textile, oil refining, etc.) and he shows the location of the plants of the company. He also names the products manufactured by that company (cotton underwear, automotive & industrial oils, etc.).

Next, he lists as much information as he can find about the chemicals used by that company, showing estimated quantities, prices, packages, suppliers, and whether or not contracted. The salesman may require several visits to the prospect before he obtains complete information in this respect.

After listing all the specific information mentioned above, the salesman then tells his story of the interview in his own words and style. He mails his report to sales control headquarters.

At headquarters the report is processed as follows: It is officially stamped with the date and hour received and turned over to the "Abstractor." In a small unit, the abstracting of the call report is done by the head of the Sales Control Department, and, in larger units, by the assistant head. In a company where there is a class of sales trainees around, it is these young men who do the abstracting of Call Reports under the watchful eye of the more experienced Sales Control Manager. These young graduate chemists and chemical engineers have definitely declared their interest in salesmanship by joining the sales training school. There are those who might at first consider a job of spending a good part of their working day reading longhand call reports (many of which are badly written) a monotonous task, but for those who have specifically set out to learn all they can about salesmanship, there is nothing more educational than to read first hand how experienced and trained salesmen peddle their wares; to note the troubles they get into; and to learn about the innumerable ways they find of getting out of them.

It is surprising to note how the seemingly countless sales obstacles can all be sorted into a comparatively few piles. Then, it is most interesting to observe how different salesmen handle these general classes of problems. Let us say General Obstacle "A" is successfully hurdled by 70% of a sales group while 30% lose the sale. Where is a better place for a sales trainee to prepare himself to hurdle Obstacle "A" when he gets out selling than to read day in and day out what other salesmen have done to overcome it. A part of every sales trainee's course should be in the Sales Control Dept. What he learns there stands him in good stead for many years to come as he pounds the pavements in search of orders. The big advantage of this type of reading matter for the sales trainee is that every word he reads is a realistic and practical representation of something that has taken place in the presence of a trained salesman. No text book stuff there; no theoretical dissertations on how to sell; but rather a word by word recording of an actual sales problem and what was done about it.

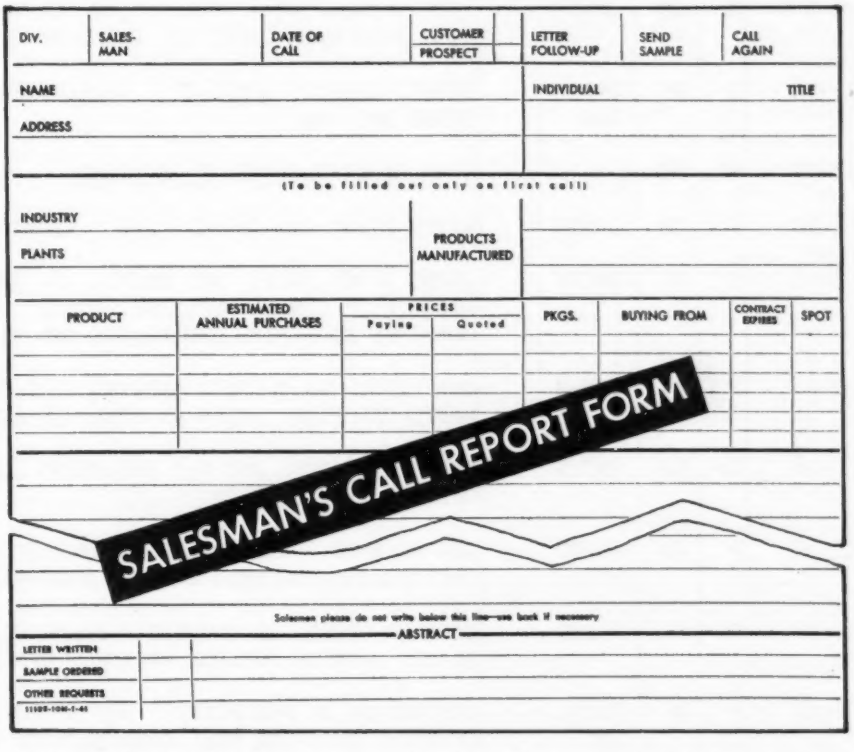
One might even go so far as to say that the Sales Follow-Up System pays for itself in the benefits derived from it by the sales trainees alone without any regard to the tremendous good such a control does in other ways.

The Abstractor carefully reads each Call Report and then writes the abstract in the space provided at the bottom of the report. He notes the check marks at the top of the Call Report, and, where indicated, he dictates a follow-up letter, faithfully observing any instructions which the salesman may have given in the body of the report regarding the letter. At all times the Abstractor must realize that he is substituting for the salesman and therefore the salesman's wishes must prevail unless contrary to company policy. The Abstractor likewise takes the necessary steps for sending samples and literature where requested and he is responsible for carrying out any other instructions given in the Call Report. Many times this involves getting in touch with other departments within the company, such as Technical Service, Accounting, Credit, Production, other salesmen, etc. Also, it is often necessary for the Abstractor to consult the Sales Manager regarding certain phases of the Call Report; or, in some cases, the Abstractor actually leaves certain matters to be handled by the Sales Manager, but wherever this is done, it is shown in the abstract. Call Reports which contain complaints on material, packages, service, etc., are referred to a "Complaint Department." Call Reports containing information of general interest to the company are circulated by memorandums to such departments and managers as may be benefited.

At the bottom of the Call Report the Abstractor notes by initials and date that he has fulfilled his obligations. He is then finished with the Call Report, which he passes on to the desk where the Daily Sales Report Summaries are made up.

DAILY SALES REPORT SUMMARY

The Daily Sales Report Summary is just what the name implies. One sheet is made up for each salesman each working day. It shows the salesman's name, the date the report covers, and the division of the company he works for. It lists each customer or prospect called upon that day, showing the city in which the call was made and the person or persons interviewed. Opposite thereto and under the heading "Remarks" is quoted verbatim the abstract of the call taken from the bottom of the Call Report form. Also shown opposite each call is the date on which the salesman wishes to call back. A space is provided at the extreme left side of the form for the reader to show by check mark any call for which he would like to examine the complete Call Report. By sending this form so checked back to the Sales Control Department the reader receives the original



CODE [redacted] J F M A M J J A S O N D PAGE No.

NAME AND ADDRESS	INDIVIDUAL	TITLE	RATING	INDUSTRY
XYZ CHEMICAL COMPANY 6317 NORTH FRONT STREET PHILADELPHIA, 49, PA	SEE HENRY JONES JOHN ROE ELMER SMITH	PURCHASING AGT PRESIDENT GEN MGR	B1	CHEMICAL

DIV.	PRODUCTS	REMARKS	DISTRICT	SALESMAN
H C	CHLORINE CAUSTIC SODA	MFG "XYZ" CLEANER - SOD HYPOCHLORITE ROE WAS FORMERLY SALES MANAGER OF "AB" BLEACH CO. CHICAGO	P	J. SMITH

DATE	By	Made By	SAW	REMARKS	Call Back
1944					
9-3	P	JS	JONES	USING T/C MONTH CHLORINE. SAME CAUSTIC 50%. CONTRACT BAL YR. SATISFIED PRESENT SUPPLIER	10/15
10-17	P	JS	JONES	NO CHG. BLANK CHEM CO IS SUPPLIER. BELIEVE PAYING SCHEDULE. WILL CONSIDER 1945 CONTRACTS FIRST PART NOV	11/1
10-30	P	JS	JONES ROE	ALSO MET ROE, PRES. CONSIDERING SECONDARY SOURCE SUPPLY 1945. EXPLAINED CHLORINE SITUATION TIGHT. SAID MIGHT SUPPLY FEW CARS CAUSTIC AND CHLORINE LATER ON WHEN AND IF AVAILABLE. SEND QUOTE	11/15
11-1	L	RC	JONES	QUOTED CHLORINE & CAUSTIC 50% SCHEDULE IN T/CS. OFFERED CONTRACT 1945 FOUR CARS CAUSTIC. CHLORINE SPOT IF & WHEN	
11-14	P	JS	JONES ROE	SIGNED CAUSTIC CONTRACT. WOULD ALSO LIKE CHLORINE CONTRACT. SAID SORRY NOT NOW	12/20
11-17	N	RC		1945 CAUSTIC CONTRACT RECORDED	
12-20	P	JS	JONES	WANTS FIRST CAR CAUSTIC JAN. PROMISED DO BEST	1-15
1945					
1-18	P	JS	SMITH	JONES & ROE AWAY. MET SMITH. NO OBJECTION USING OUR CAUSTIC ALONG WITH OTHER SUPPLIERS. GLAD TO GET ANY MATERIALS THESE DAYS. CONSIDERING ADDING NEW BRANDS AND EXPANDING SALES TERRITORIES.	2-17
2-20	P	JS	JONES	OUR FIRST CAR CAUSTIC ARRIVED GOOD SHAPE. ALL IS WELL HERE. WANTS CHLORINE. WISH WE COULD DO SOMETHING HERE.	3-14
2-28	L	RC	SMITH	SENT LITERATURE AND T/C UNLOADING INSTRUCTIONS AS REQUESTED. OFFERED TECH SERVICE	
3-19	P	JS	JONES ROE	ALL OK HERE. WILL BUILD PLANT PITTSBURGH END WAR. GOOD CHANCE GETTING ALL BUSINESS THERE. FOLLOWING CLOSELY	4-18
4-22	P	JS	JONES	GAVE ME ORDER CAR CAUSTIC. PLANS WELL ALONG FOR NEW POST WAR PGH PLANT. ADVISE OUR PGH OFFICE. OFFERED TECH SER & LAY OUT PLANS	5-28
5-28	P	JS	JONES ROE SMITH	DISCUSSION RE PGH PLANT. ROE GOING PGH 7-9. HE WILL VISIT OUR PGH OFFICE. SEND PGH FULL CASE HISTORY THIS ACCOUNT.	7-17

MASTER CARD

1114C-SM-1-41

Call Report or a full copy. These Daily Sales Report Summaries are made up in as many copies as are needed (predetermined) for distribution daily to the sales manager, divisional managers, officers and others directly interested in sales activities. A copy is mailed to the salesman to use as he pleases. One copy (the official file copy) of each salesman's Daily Sales Report Summary is clipped to his Call Reports for that day and the sets are then passed on to the desk where entries are made onto the Master Cards.

THE MASTER CARD

Here is the "heart" of the Sales Follow-Up System. The particular form used is unimportant, and there are several good designs from which the individual sales department may choose the one that best fits its needs. The Master Card herein referred to is designed from the common ledger card such as is often seen in the Accounts Receivable Department of any company. The ledger card made out one for each customer and filed alphabetically has been the master control card for accounts receivable for many years. Onto it are posted all the financial transactions with each customer. It is the case history, accounting-wise, of each person or firm who buys from the company. There is nothing new about it; it has been used for years and found successful. It seemed therefore a good idea to design the Master Card, illustrated in this article, from the ledger card pattern. On it is posted a record of all sales activities with each customer and each prospect. It is then the case history, *sales-wise*, of each person or firm that comes into contact with the Sales Department.

Regardless of the form that is selected for the Master Card, there is certain basic information that should be entered on all types.

The top of the Master Card is marked off into months of the year, each month being designated by the first letter of the month: "J"—January; "F"—February; "M"—March, etc. Each month in turn is divided into three equal parts each representing ten days. Signal flags later described operate across the top of the card. At the upper left hand corner is a space marked "Code" which is also used for signal flags to indicate various types of information as pre-determined and requested by the Sales Manager and his staff. At the upper right hand corner is the page number. It requires more than one Master Card for many active customers, and page numbers apply only in cases where a first card for a given customer becomes filled so that a second card must be started for the customer.

The second tier across the head of the Master Card provides space for the customer's or prospect's name and full address, the individuals to see and their titles, the financial rating or other desired ratings, and the name of the industry to which the customer or prospect belongs (i. e., Steel, Textile, Railroad, etc.).

The third tier provides for identifying the division of the salesman's company to which the customer or prospect belongs, the products it uses in which the salesman is interested, any special remarks that are pertinent, the district in which the customer is located, and the name of the salesman assigned to the account.

The body of the Master Card is for the recording of the abstracts from the Daily Sales Report Summary and all other sales activities. It is divided into six columns, namely, "Date"; "By"—meaning by what means does the activity take place [i. e., personal call (P), phone call (T), letter (L), or telegram (W)]; "Made by"—meaning the salesman's name; "Saw"—meaning the person interviewed; "Remarks"; and "Call Back Date." The Master Cards are filed alphabetically by customer and prospect name.

The next step in the sales control routine is for the clerk in charge of the Master Card file to copy the abstracted information from the Daily Sales Report Summary onto the Master Card. The Master Cards are removed from the file f those customers or prospects on which previous calls have been made, and new Master Cards are set up for those companies for which no Master Cards have been previously established. After the Daily Sales Report Summary abstract is typed onto the Master Card, a "green" signal flag is placed at the top of the Master Card and it is moved to the month and approximate day which was designated by the salesman as his call-back date.

Next, the Master Card clerk prepares a Tickler Slip. This form lists the salesman's name and the call-back date. It repeats the name and complete address of the customer or prospect, the name of the individual to see, and the chemical or chemicals in which the salesman is interested. The slip also provides space for notes of sales activity since the salesman's last call there. This Tickler Slip is then placed in a pending file set about ten days prior to the call-back date, at which time it is mailed to the salesman as his official reminder. As the clerk is about to mail the Tickler Slip to the salesman, he removes the Master Card from the file and changes the "green" signal flag referred to above to a "red" signal flag. That Master Card continues to carry the "red" flag until either a Call Report is received or word of some kind arrives which automatically gives the Master Card a clear signal (green flag) to the next call-back date. A quarterly check up is made by the Master Card clerk on all "red" flag masters that are overdue, and second notice Tickler Slips are sent to the salesman on all call-backs that are overdue by one month or more. A salesman may have call-back dates changed to his convenience by simply returning the Tickler Slip to the Sales Control headquarters with a notation of the new call-back date.

A special colored carbon copy of all sales department letters to customers and prospects is automatically routed (by its color) to the Sales Control Department. Whenever the subject matter contributes to the case history of an account, such correspondence is abstracted by one of the Abstractor group in much the same manner as a salesman's Call Report is abstracted, and the abstract is then posted onto the Master Card for that customer or prospect.

Information of special significance regardless of source is typed directly onto the Master Card as a "Note."

Sales department personnel are furnished with pads of "Quote Slips" which they use for reporting quotations given verbally to inquirers. These slips list the name and address of the company to which the quotation was given as well as the individual to whom it was given and the date. The slip also provides for listing the chemical or chemicals quoted, the prices, quantities, packages, and f.o.b. point. A space is provided for special remarks and by a check mark the writer can request Sales Control to confirm the quotation. Quote Slips are written up in duplicate. The original is sent to the Sales Control Department where it is posted onto the Master Card and the duplicate is sent to the salesman responsible for the account. Wherever the conversation merits a call report then no Quote Slip is made out since this would be a duplication.

Reports of personal calls made to the office by customers or prospects are reported on either Call Report forms or Quote Slips.

Contracts and contract renewal or extension letters are all routed through Sales Control and recorded on the Master Cards. This completes the cycle of postings onto the Master Cards.

SALESMEN'S PERSONAL RECORDS

In general, the salesmen are left to their own best judgment in keeping their personal supplementary records. The principal advantage to this flexible provision is that it encourages the field men to exercise their own initiative for organization. What is more, the proof which they receive daily of accurate and complete home office control stimulates their interest in individual case histories and other records.

Regardless of what system the salesman chooses to use for his own records the Sales Control Department has a complete check on his activities. On the other hand, the field staff are encouraged by the Sales Control Manager to follow a pattern consistent with the records at Sales Control headquarters. For those salesmen who do need help in setting up their method of recording, the Sales Control Manager has a variety of individual sys-

tems to suggest. Samples of suggested salesmen's personal record sheets are exhibited with this article.

III-SALES STATISTICS

AT THIS point sales control begins to talk the Sales Manager's own language. Here all the hard work of the field staff and of management is reduced to cold dollars and pounds. This is, of course, an important phase of any sales control system. Yet, describing this phase on an industry basis in an article of limited space is difficult because no two companies and, as a matter of fact, probably no two sales managers want exactly the same sales statistics. This phase of sales control is an especially custom-made job, and therefore, the description here is confined to some of the fundamental points.

First of all, the sales statistics show *dollar sales and usually pound sales* per month for each:

(a) Customer
(b) Salesman
(c) Territory (where more than one salesman operates)
(d) District Office
(e) Company Division
(f) Company as a whole

Second, the over-all cost of each salesman is calculated, and such cost, of course, includes his salary and all travelling expenses plus bonuses and commissions.

Third, the net profit before taxes from each salesman's activities is determined by making the following simple calculation:

(a) Total Sales of Salesman "A" $.....
LESS:
(b) Manufacturing & Delivery costs of goods sold. (This is arrived at *by formula* and not by an actual cost analysis of each sale.) $.....
(c) Pro-rated share of Division and company overhead $.....
(d) Cost of Salesman $.....
(e) Total Cost $.....
(f) Net Profit from Salesman "A" $.....

In addition to these basic sets of figures, the following monthly or quarterly calculations and comparisons are made:

A—(1) Average cost per call of each salesman
(2) Comparisons of these between salesmen and districts
B—(1) Sales by consuming industry
(2) Comparisons of these between salesmen and districts
C—(1) Sales by product
(2) Comparisons of these between salesmen and districts
D—(1) Sales to Jobbers vs. Sales to Consumers
(2) Comparisons of these between salesmen and districts

It is true, of course, that all chemical companies develop sales statistics to varying degrees, and some companies already have organized highly developed Sales Statistics Departments. However, the majority of chemical companies have not gone all the way. Then, too, there are many companies which are not getting the full good from the statistics they do develop because of lack of coordination between sales statistics and over-all sales activities. With the establishment of a Sales Control System, all existing sales statistics activities are transferred into and become a part of the Sales Control Department.

Sales statistics are produced by two different general methods, namely, (a) mechanical methods (example: punched card system) and (b) manual methods.

In cases where a mechanical system is already in operation or where such an installation is contemplated, all of the above suggested statistics are provided without difficulty once the desires and needs of the Sales Manager are made known to the chief operator of the tabulation unit. It would require a lengthy article in itself to describe mechanical tabulation methods and there is not room here for such a discussion.

In cases where sales statistics are developed by manual means, the problem is more difficult because it involves the slower, more laborious operations of hand posting from invoices and in some cases from orders onto record sheets of one kind or another. Here again the subject would require a long article to describe.

The key to the successful development of accurate sales statistics is a carefully compiled *"Code Book."* Regardless of whether the statistics are made up by mechanical or manual systems, they are only as accurate and as complete as the *Code Book* itself.

THE CODE BOOK

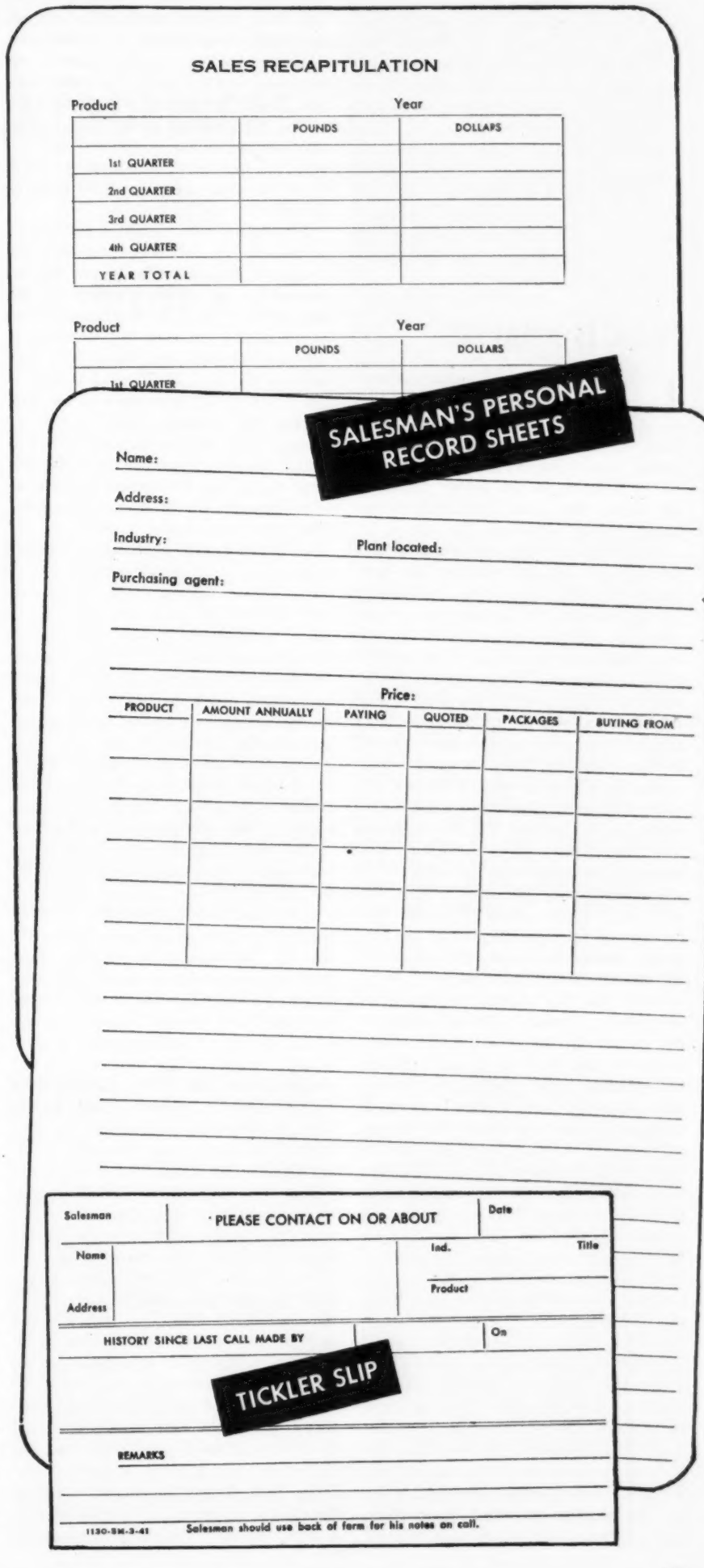
The Code Book is an over-all plan for assigning orders and invoices to their proper place in the tabulation of sales

activities. The book describing the plan gets its name "CODE" from the fact that for brevity the various assignments are represented by figures. Thus, an invoice covering a sale of chlorine to the XYZ Chemical Company in Chicago, Illinois, by salesman "A" might be marked for tabulating purposes 02105-1-43-88-7-32100. Establishing the formula for arriving at the code for each particular invoice is an important job. Literally, hundreds of individual decisions must be reached—and these with a high degree of consistency—by the *Sales Manager and his staff*. This is one job that the Sales Manager must not delegate "down the line."

The country is carefully divided into well defined geographical divisions and these divisions are painstakingly subdivided into territories and perhaps subterritories. The rules for classifying customers and prospects by industry are made with care. Rules for assigning customers to the salesman are specific and consistent. For instance, there are many customers situated so that the purchasing office is in one territory and the plant in another territory. The question frequently comes up as to whether the salesman in the territory where the purchasing office is located should get credit for the account or the salesman in the territory where the plant is located. It doesn't matter so much which of the two alternatives is selected as it does that there be consistency in such selections. In this way, good breaks and bad breaks for the individual salesmen pretty well average out. The non-assignment of larger customers (often referred to as "House Accounts") is kept to a minimum if permitted to exist at all. Rules covering the assignment of salesmen to their respective territories are set up with circumspection. Then, after all necessary "class" rules have been established, there remain scores of individual exception cases to be disposed of. Here especially, care and forethought are required on the part of the Sales Manager in making decisions. Once the classification rules are established, they are made known to the entire field staff so that each salesman knows beyond question where he stands regarding his territory, his accounts, and his products. The complete list of all these classifications is then the *Code Book*.

SALES STATISTICS FORMS

Such a wide variety of forms for recording sales statistics is available that there is no need to discuss them here. For small Sales Control Departments, the back of the Master Card is used for recording such statistics, and this provides a streamlined record because a single card then contains a complete record of all sales activities for a given account. However, in larger Sales Control Departments and especially where mechanical tabulating is done, a separate cus-



SALES RECAPITULATION

Product Year

	POUNDS	DOLLARS
1st QUARTER		
2nd QUARTER		
3rd QUARTER		
4th QUARTER		
YEAR TOTAL		

Product Year

	POUNDS	DOLLARS
1st QUARTER		

SALESMAN'S PERSONAL RECORD SHEETS

Name:

Address:

Industry: Plant located:

Purchasing agent:

Price:

PRODUCT	AMOUNT ANNUALLY	PAYING	QUOTED	PACKAGES	BUYING FROM

Salesman | PLEASE CONTACT ON OR ABOUT | Date

Name | Ind. | Title

Address | Product

HISTORY SINCE LAST CALL MADE BY | On

TICKLER SLIP

REMARKS

1130-SM-3-41 Salesman should use back of form for his notes on call.

tomer sales statistics record sheet is desirable, but it is important that all customer sales statistical records be filed and maintained in close proximity with the Master Cards so that they can be used together when complete case histories are required for study.

As important as Sales Statistics are, they are not complete in themselves in the Sales Control system. To do the most good for busy sales executives, these statistics are converted into *trends*—which lead to a discussion of the final phase of the Sales Control system.

IV-SALES ANALYSIS

LET US think for a moment of Chemical "X" which is a widely used metal cleaner. A strike in the automobile plants in the Detroit area is quickly reflected in a decline in the sale of Chemical "X." A strike in the rubber plants in the Akron, Ohio, area immediately brings about a great decrease in the sale of, let us say, Chemical "Y," which is a popular antioxidant. The sales statistics for these chemicals show dips during this period. At the moment the well informed Sales Manager realizes that the cause of the lower sales figures is the strike in Detroit or Akron. As time passes, however, the strike fades out of the picture, but the sales statistics in the meantime have become a part of the permanent record of the company. There comes the time when the Sales Manager calls out old sales records for comparison with current sales of Chemical "X" and Chemical "Y." He is pleasantly surprised to note increases, and he plans future sales activities accordingly. The sad part of the story is that this Sales Manager may be living in false paradise for he has forgotten about the automobile strike or the rubber strike, and thus he fails to consider the true reason for the sales differences. Actually, after adjusting the old records for the period of the strike, it may be true that current sales are below previous sales. Thus, an entirely false picture has been created in the sales manager's mind even though the figures which formed the basis for the picture are in themselves correct. A sales analysis, on the other hand, fits the statistics into their proper place within the over-all picture. By building sales analyses on solid foundations of sales statistics, the Sales Manager is provided with a watch tower from which he can view each situation in its entirety.

Sales analysis requires careful definition, and then the analyses must be kept within the boundaries of that definition; otherwise, they are apt to creep over into another field which belongs to a Market Research Department. Sales analyses are confined to products which the company is already selling on a commercial scale, and to industries in which the product is already used, and to territories wherein the company is already operating with its field staff. In other words, sales analyses are made of established or partially established markets whereas market research surveys are made of potential markets. Both are equally necessary, but neither must wander afield. In this way, sales analyses follow market research surveys and, in a sense, sales analyses check the degree of accuracy of market research surveys.

To explain sales analysis further let us consider the following situation: The company's Research Department has developed a new pickling chemical for the steel industry. The Market Research Department has surveyed the industry to determine among other things (1) how much of this type of chemical is used in this field and (2) how much of the total market the company might expect to capture. The Market Research Department's report is favorable, and Management directs the Production Department to produce this new product commercially. The Sales Department is given the job of selling the new chemical, but before it is assigned as a commercial product to a divisional sales manager, explanatory and introductory sales are made by a Sales Development Group. This group has the responsibility of ironing out the wrinkles of the product from a practical commercial point of view. When commercial sales are established by this group, a final sales development report is made and the product is ready for assignment to an established sales division of the company. As a start, the Sales Manager works up his sales program on the basis of the Sales Development Group's report, and the field staff is then given its assignment.

Soon, case histories begin to appear on the Master Cards of the Sales Follow-Up System. Likewise, sales statistics make their appearance in the month-end sales figures. Using this data as the foundation, the Sales Control Manager or one of his executive assistants will prepare a sales analysis. This report lists (1) the detailed results of the sales activities to date and (2) projects those results into a *trend* to show what may be expected from this comparatively new activity for sometime in the future.

Thus, by studying the sales analysis made up by the Sales Control Department and comparing it with the Market Research Department survey and the Sales Development Group's report, the Sales Manager is in an advantageous position to extend, drop, or re-shuffle the original sales program for the new product with a feeling of confidence in the decision he has made.

Many types of sales analyses are prepared pointing to the activities of the individual salesman, and these are enlightening. For instance, a study of the Daily Sales Report Summaries covering the calls of Salesman "A" combined with a study of sales statistics covering the sales made by Salesman "A" and the costs of those sales may disclose that although Salesman "A" is making plenty of calls and selling many accounts, he is nevertheless operating badly because he is devoting so much time to the sale of Chemical "Z" that he is neglecting the balance of his line of products, many of which are more profitable to the company than Chemical "Z."

Also, sales analyses show that often a salesman is partial to a given industry with the result that his time is poorly and unfairly divided over his entire territory. This leads to inefficient operation.

Sales analyses quickly throw a spotlight on situations where the salesman is putting too many eggs in one basket or too few eggs in each basket.

All salesmen are pretty much alike in that they unconsciously develop favorites in their line of products, and in the industries within their territories, and in accounts they call upon. With this natural tendency prevalent, unbalanced selling creeps into each territory and that is why companies employ Sales Managers and their administrative staffs. To do his job well, the Sales Manager has to have good analytical reports covering each situation within his domain.

By setting up various combinations of the vast amount of cumulative sales data which flow onto the Master Cards from the salesmen's Call Reports and other sources of information with the sales statistics which are tabulated each month or each quarter and, from this projecting and explaining trends, the Sales Control Manager and his staff can keep a continuous flow of condensed, vital information moving into the hands of the Sales Manager and all other interested executives of the company. To take the time and space here to describe further types of sales analyses seems unnecessary.

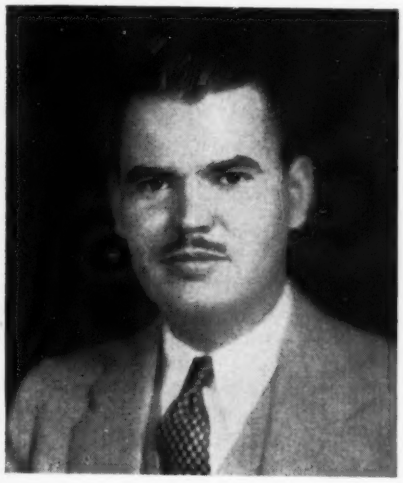
CONCLUSION

Much has been written here and in the preceding issue of CHEMICAL INDUSTRIES about sales control, yet we have barely scratched the surface. As previously pointed out, the designing of any given company's sales control system is of necessity such a highly individual problem that it is indeed difficult to write any practical description of the organization of such a system on a blanket basis. What we have tried to do here is: (1) emphasize the importance of servicing the field staff more adequately, which, in turn, makes for better sales efficiency; (2) describe a basis for recording and following up the salesmen's work; and (3) set forth some fundamental thoughts for providing sales statistics from which comprehensive sales analyses may be developed. These are the principal points that go toward making up any sales control system. A friendly, co-ordinated Sales Department working with harmonious and reciprocal relations throughout is the reward for intelligent sales control.

HEADLINERS in the NEWS

EDWARD F. WAGNER has been named chief chemist of the Witco Co., where he will be engaged chiefly in directing product development work.

FRANCIS J. CURTIS, vice-president of Monsanto Chemical Co., has been elected chairman of the American Section of the Society of Chemical Industry.



RAYMOND L. COPSON, formerly chief of chemical research and engineering for the Tennessee Valley Authority, will direct research for Rumford Chemical Works.

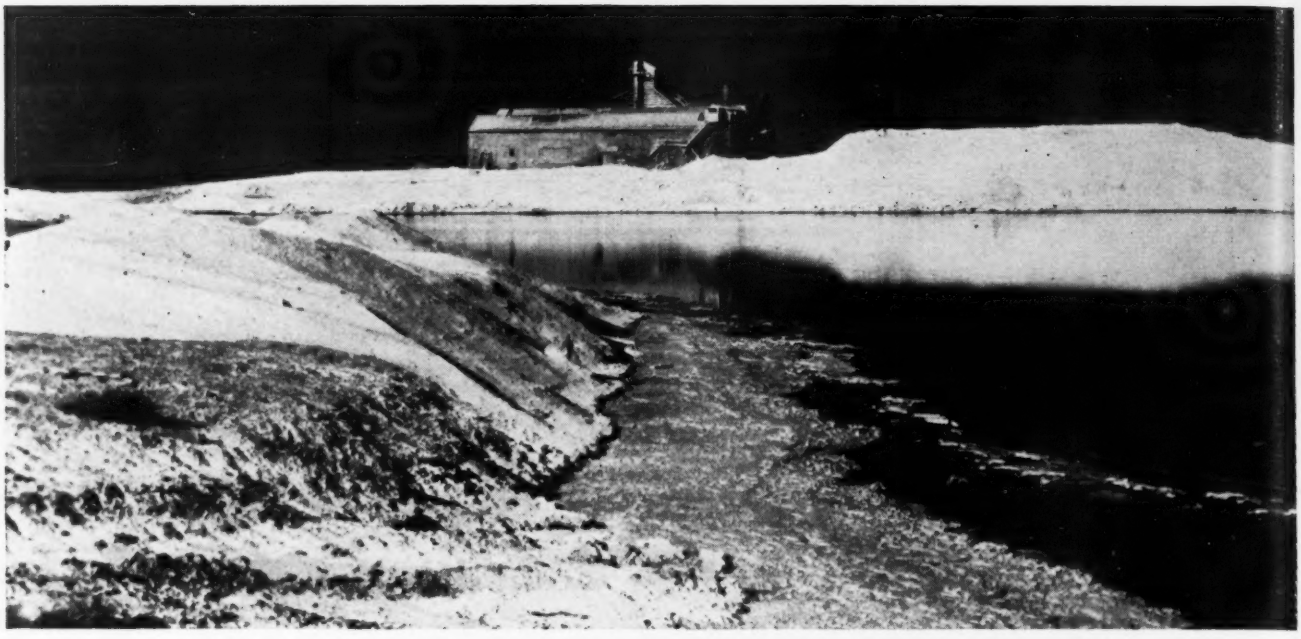
W. G. BYWATER, for the last ten years a leader of research work on the staff of Parke, Davis & Co., has been appointed director of research for S. B. Penick & Co.

WARD V. EVANS, chairman of the department of chemistry at Northwestern University, will receive the 1945 Honorary Scroll Award of the American Institute of Chemists.

E. R. BARTLETT, previously executive vice-president of the Hooker Electrochemical Company, has been named president. His association with the company started in 1907.

HARRY M. HOOKER, according to the board of directors of the Hooker Electrochemical Co., has been elected as chairman of the board. He was formerly president.

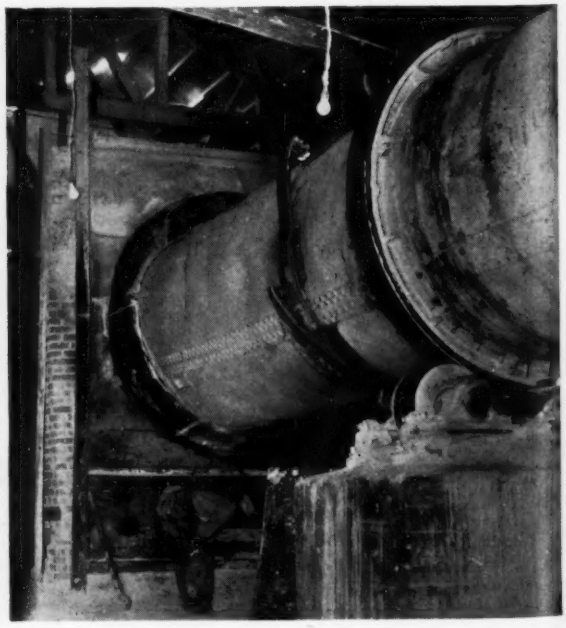
JOSEPH K. ROBERTS, on the staff since 1928, has been promoted to the position of general manager of research for the Standard Oil Co. (Indiana).

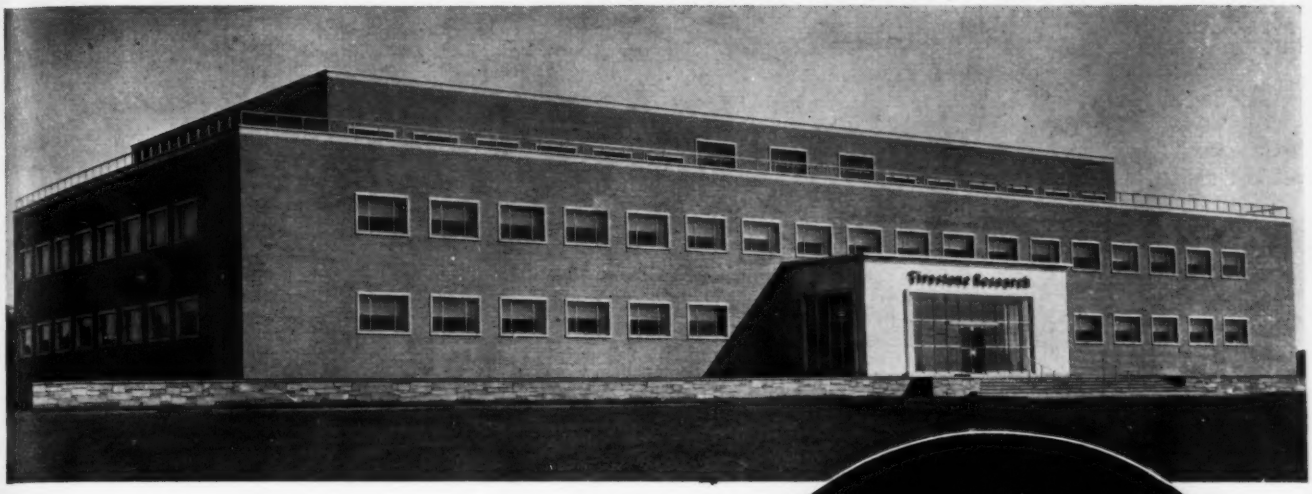


Canadian Sulfate

From undrained prairie lakes in Saskatchewan, Midwest Chemicals Ltd. yearly garners thousands of tons of sodium sulfate. The bulk of the output is sold by Canadian Industries Ltd. for use in making kraft paper and glass, smelting nickel and copper, and the chemical industry. White Shore Lake, pictured above, 10½ miles long and half a mile wide, contains an estimated 20,000,000 tons. The bucket chain at right carries raw salt into the plant. The workman shown signalling to tractor to stop, shovels salt from dock pile to conveyor. Below, left, is an example of the tractors with scrapers that resemble bulldozers, which are used to pile up reserve stocks. When rains or melting snow dissolve crystals, brine is pumped into a 23-acre reservoir where recrystallization takes place and almost 100 per cent pure crystals are formed.

Giant revolving drums, below right, each 7 feet in diameter, and furnaces refine by drying process.

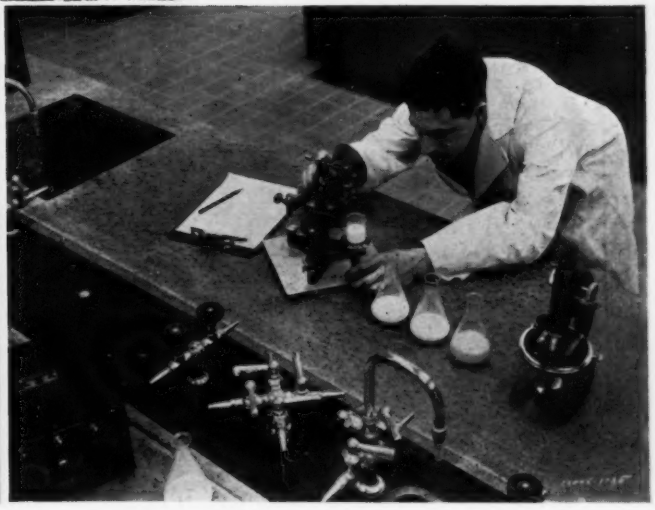


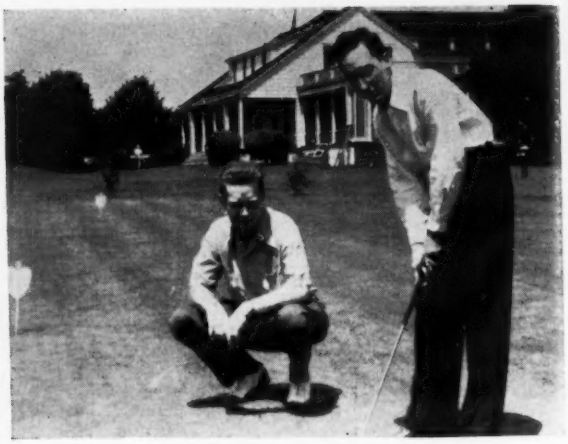


Firestone Opens $2,000,000 Research Lab

Firestone's new $2,000,000 research laboratory is a three-story, sound-proof, air-conditioned brick building, which overlooks the Akron plants. The entrance is of glass and Georgia white marble. Also marble are the stairs, pictured at right, which lead from the lobby to the second floor. The walls are blue glass.

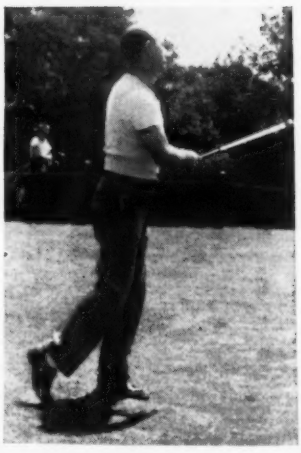
In the library, at left, may be seen a bust of chairman John W. Thomas. Below are two laboratory views. On the left, a typical six-man working unit, which may be made smaller by arranging the walls which come in sections. At right, a technician uses a tensiometer to measure the surface tension of a liquid. Note the central service cores in the foreground which put at the scientist's fingertips hot, cold and distilled water, steam, gas, compressed air and facilities for creating a vacuum.

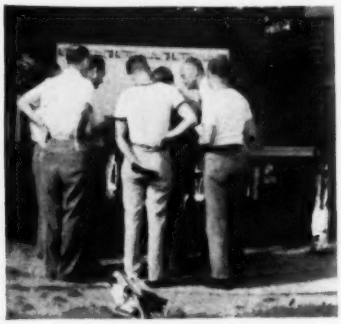




Salesmen Golf At Garden City

On July 12 the Salesmen's Association of the Chemical Industry held its summer golf outing at the Garden City Country Club. Putting above left, wearing a white golf cap, is Larry French of Oldbury Electro-Chemical Co. Pictured clockwise around the page are Bob Fisher, Fisher Chemical Co.; Mike Hayes of American Alkali & Chemical Co. on the green with George M. Dunning, Jr., Empire Chemical Co.; Phil Lo Bue of Michigan Chemical Co.; and Charlie Alexander of L. Sonneborn. Players check the results of the day. Next are Charlie Griffith, R. W. Greef & Co., Inc.; Gene McAuliffe, Glyco Products Co., Inc.; Harold Geen of L. Sonneborn; Vic Williams, Monsanto, and Jim McInnes, Commercial Solvents.





NEW

PHENYL TRIMETHYL AMMONIUM HYDROXIDE

This new Monsanto product suggests itself strongly as a practical neutralizer of acids where solubility of the product salt in polar organic solvents is desired . . . also, as a strong organic alkali, for the manufacture of organic salts, e. g., silicates. Now available in working, experimental quantities. Address: MONSANTO CHEMICAL COMPANY, Merrimac Division, Everett Station, Boston 49, Mass.

PROPERTIES OF PHENYL TRIMETHYL AMMONIUM HYDROXIDE

Form:	19-20% aqueous solution of phenyl trimethyl ammonium hydroxide.
Sp. Gr. Alkalinity:	1.06 @ 20°C. for 20% solution. Strong alkali, very corrosive, rapid disintegration of cellulose
Color:	Straw yellow to light orange.
Freezing point:	Indeterminate. Below −20°C.
Weight per gallon:	8.8 lbs.
Toxicity:	Not for internal use. It burns the skin in exactly the same manner as any strong alkali. Rubber gloves must be used in handling.
Inflammability:	None.
Chemical constitution:	$C_6H_5(CH_3)_3NOH$ 19–20% H_2O 81–80%
Stability:	Stable below 35° C. @ concentrations, up to 20%.
Tentative specifications:	Strength — 19–20%. Color — Light yellow to light orange. Clarity — Perfectly clear, free of any cloud or insoluble suspension. Ba_+ or SO_4 — Free from either unless traces of either may be specified.

CONTAINERS	
Containers:	55 gal. reconditioned steel drums, 460–470 lbs. net, 510-520 lbs. gross. 30 gal. drums, 275 lbs. net, 305 lbs. gross.
Action on containers:	Smaller lots could be shipped in cans. Glass containers might be used. No action on the metal drums. Material will etch glass badly and storage in glass is not advisable.
Government restrictions:	Materials themselves not under allocation but prime raw materials for D.M.A. are. 6-8 weeks required for delivery of D.M.A.
Freight classification:	Chemicals NOIBN.
Labels:	Strong alkali.
Hazard:	Same as any strongly alkaline material.

MONSANTO CHEMICALS

SERVING INDUSTRY...WHICH SERVES MANKIND

BETWEEN THE LINES

Status of German Chemical Industry

Despite substantial bombing, it is reported by returning technical investigators that the huge German chemical industry is not so badly damaged but what it can be rebuilt in a short time. The question now is how much of it should be. Recalling experiences after the last war, official Allied thinking is preponderantly on the side of economic and industrial as well as military disarmament, which would mean vast permanent reductions in the German capacity for making chemicals. Here is a brief summary of the present and prewar state of this branch of German industry.

FOR many months now the Foreign Economic Administration, through a specially constituted "Enemy Branch," has been making a broad and inclusive study looking to steps for the economic and industrial disarmament of Germany.

Necessarily Germany's war potential in chemical output has received a major share of attention from this group, which comprised among others, a special chemical unit, of which Dr. D. P. Morgan, director of the War Production Board Chemical Bureau serves as Acting Chairman. Col. Frederick Pope, of the Office of War Mobilization and Reconversion, is actual chairman of the organization.

The surveys on the ground of these and other experts in the wake of the occupying American forces have revealed that Allied bombing and military operations accomplished their mission. Despite the rather substantial bombing damage, however, it was reported as an overall conclusion later, that the capacity of a huge German chemical industry remains, or can be rebuilt in a short time.

Some segments of this industry, in fact, such as that devoted to synthetic petroleum production, are capable of a high level of operation in the near future, given an opportunity to repair and rehabilitate damage suffered toward the latter stages of the war. This damage was substantial, it was found, and curtailed operations, but the evidence of recuperative power was convincing to those who studied the ground.

Moreover, the later stages of the war provided ample testimony, it was recalled, to the German technical ability to produce new weapons and materials as a result of organized technological research and development. Many raw materials are still available to provide the working base for a new industrial potential, despite the war damage—coal in the ground in huge deposits, forests, and "the marvelous capacity," as returning experts termed it, for synthetic production, making available supplies of textiles, rubber, petroleum, nitrogen and the numerous other items which Germany does not possess in the natural state.

Germany lacks many basic raw materials, and the figures show that this deficit was met in the immediate prewar years by increasing the German imports of these from Southeastern Europe, or elsewhere, and in war years, by Germany's access to the Balkans and Central European sources of some of these materials. Germany is dependent wholly, or in large part, on synthetic production or on imports, for petroleum, rubber, manganese, chrome, bauxite, fats, and such metals as zinc, lead, nickel, copper, and other needs.

Germany solved some of these problems by production of such synthetics as rubber and oil. Synthetic production was not the whole answer, hence German imports in the 1934-39 period show increases of 262 percent in bauxite imports, 130 percent in chrome ore, 57 percent in petroleum, 34 in rubber, and large rises in imports of the other metals and materials mentioned. However, Germany's total imports of all kinds increased less than 10 percent in that time. Significantly, the United States and the United Kingdom were the two principal exporters to Germany in those years.

In many chemical resources, on the other hand, Germany's potentialities are well known. Thus, in dyes and chemicals, Germany, less than four times the size of New York State, and with five times that state's population, has one dye plant that alone can turn out almost as much dye in a year as all the plants in the United States together—so the technical missions returning to this country reported. Not one of that plant's windows has been shattered, they found.

In the first World War this plant, using the equipment needed just for dyemaking, was a key unit in producing poison gas, which figured so importantly in that conflict. In the present war, just ended for Germany, this plant made great quantiti of chemical materials for ordnance, and the reports added, "it is in perfect operating condition today."

Allied bombers pay a visit to Ludwigshafen, site of German I. G. plants for methanol, nitrogen, synthetic rubber, synthetic fuels and dyestuffs.

Nitrogen Capacity Enormous

Germany had an enormous producing capacity of chemical nitrogen. In 1936-37, figures show, the world output was around 2.6 million metric tons, and in 1939, Germany was producing about 1,000,000 metric tons and had a potential capacity of at least 1.6 million metric tons. It was this capacity, the experts now

Continuous production . . .

24 hours a day . . .

that's the wartime record of

VICTOR OXALIC ACID

PARTIAL LIST OF

VICTOR

Chemicals

Acids . . . formic, metaphosphoric, oxalic, phosphoric, polyphosphoric.

Formates . . . aluminum, sodium, sodium boro-.

Metaphosphates . . . aluminum, ethyl.

Orthophosphates . . . ammonium, calcium, iron, magnesium, potassium, sodium.

Oxalates . . . calcium, sodium.

Phosphorus (yellow)

Ferrophosphorus

Phosphorus compounds . . . chlorides, pentoxide.

Pyrophosphates . . . calcium, sodium acid, sodium iron, tetrapotassium, tetrasodium.

Sulphates . . . magnesium, sodium aluminum.

Here is one record of which we are quite proud. It has been made possible only through skillful management, maintenance, and operating supervision. All through the war years Victor's Oxalic Acid plant has been on the job . . . day and night.

The requirements for Victor Oxalic Acid still exceeds the supply . . . but some day, soon it is hoped, we will again be in a position to fulfill the demand for this 99.8% pure product. Clean, sparkling white Victor Oxalic Acid is available in several granulations, and packed in 325-lb. barrels or 130-lb. drums.

Peacetime uses of Victor Oxalic Acid are extensive . . . as a laundry "sour" . . . in radiator compounds . . . for cleaning railway cars . . . removing iron stains from marble, cotton linters, wood pulp, etc. . . . preparing metal polish . . . making blue print paper . . . bleaching wood floors, straw, colored candles (to salvage wax), etc. . . . removing rust stains from rosin . . . making basic dyes . . . as a leather stuffing compound and bleach.

VICTOR CHEMICAL WORKS

VICTOR *Chemical Works*

ARMY NAVY E

HEADQUARTERS FOR PHOSPHATES • FORMATES • OXALATES

141 West Jackson Boulevard, Chicago 4, Illinois

NEW YORK, N. Y.; KANSAS CITY, MO.; ST. LOUIS, MO.; NASHVILLE, TENN.; GREENSBORO, N. C.

PLANTS: NASHVILLE, TENNESSEE; MT. PLEASANT, TENNESSEE; CHICAGO HEIGHTS, ILLINOIS

recall, that supplied the nitrogen for demolition bombs that flattened Rotterdam, Warsaw, and damaged London, Coventry, and other cities. More than 28 percent of the contents of each of these bombs consisted of chemical nitrogen pulled from the atmosphere over Germany. The plants that supplied this nitrogen were large enough to supply great quantities for explosives of all kinds needed by the German forces, quite apart from the air bombs. And, it is now concluded, a large part of this capacity remains, or can be rebuilt in a short time.

The German coke ovens which produced the coal byproducts needed also for explosives, produced 2,228,000 metric tons of coal tar in 1937, just about 115,000 tons less than the ovens of the whole United States that year. Here again, German capacity is found to be considerably greater than in that time, and not materially reduced by military action during the war. The chemical compounds needed in war, obtainable from this source, are too numerous to be detailed, but can be surmised.

Germany did not lack materials for textiles during this war, as in World War I. In 1934, Germany imported nearly 400,000 metric tons of raw cotton and cotton yarn for domestic use, and even for sizeable exports of textiles. Today, Germany is found to have rayon factories with a combined capacity of at least 450,000 metric tons, and no longer has to worry about overseas cotton supplies, assuming she envisions another war. Part of Germany's rayon is used to supplement the limited supply of wool on hand, and to provide high-tenacity fibres for industrial purposes.

The verdict in this case also is that there has been little apparent damage of a lasting nature to most of the plants, and Germany today is still in a position to produce essential synthetic fabrics and fibres.

On rubber, the story is the same. Germany imported in 1933 some 60,500 metric tons of raw rubber and semi-manufactured goods; today, the German synthetic rubber industry has a capacity of more than 100,000 tons. Reports on its quality and the German processes are not as favorable as those on similar U. S. production, but the German product has evidently gotten Germany through the war, and might serve again.

Germany's synthetic oil industry has come in for considerable study. In 1934 that country was consuming less than 4,000,000 tons of petroleum products, and of that total, approximately 300,000 tons were supplied from German natural petroleum. By the following year Germany was reported to be manufacturing about 300,000 tons of synthetic oil, and nine years later, by 1944, production amounted to about 1,000,000 tons of natural petroleum and about 5,500,000 tons of synthetic oil. This was within the old borders of Germany. Allied bombing had done considerable damage to this industrial set-up by the last year of the war, but it is now believed that a large part of Germany's 1944 capacity could be restored in a brief period.

Coal, however, is Germany's major raw industry material, and almost the only one. But coal, it is recalled, enters manufacture of synthetic gasoline, the nitrogen-fixation processes, dye manufacture, pharmaceuticals, plastics, and many others. And on coal, Germany ranks with the United States, United Kingdom, and the Soviet Union as one of the important producing countries of the world. It was only in the last months of the war, it is now reported, that Germany's output of bituminous and subanthracite dropped much below the 187,000,000 metric tons of 1938-39.

Germany has vast fields of its famous "brown coal" in addition, half of it in central Germany, that requires only to be scooped from open pits, which was used during the war as fuel for German electric power, to make briquettes and coke, and for manufacture of liquid fuel. In March, 1944, production of brown coal had jumped to nearly 250,000,000 tons per year, against the 187,000,000 reported for this output in the 1938-39 period.

German aluminum capacity, currently rated at around 250,000 tons, against approximately 40,000 tons in 1933, is believed to be still available.

What to Do About It?

So much for the findings. These have been reported and the question is now before the nations concerned as to what to do about them. American authorities, so far as their public views indicate, are unanimous on the general principle that none of this war-making potential shall be allowed to remain.

There appears to be general recognition that allied countries made a mistake in this respect after 1918, and the pertinent record of official attitudes and dealings in that postwar era are now brought out and attached to the findings in the present instance as a reminder.

Thus, it is recalled, reparations in finished and semi-finished goods were readily accepted from Germany, and this arrangement is now charged with having been an important factor in German industrial and economic rearmament. Enlarged plants, left from 1918, were kept going and expert staffs kept intact to meet reparations payments in goods.

The effect was two-fold: corresponding production in the receiving countries was kept down, and in the field of dyestuffs, for example, foreign users of German

(*Turn to page 357*)

SUPPLIERS SINCE 1838

COCOANUT OIL
Castor Oil
Corn Oil
Cottonseed Oil
Olive Oil and Foots
Peanut Oil
Rapeseed Oil
Sesame Oil
Sunflowerseed Oil
Lard Oil
Neatsfoot Oil
Tallow and Grease
Lanolin and Wool Fat

FATTY ACIDS
Red Oil
Special White Oleine
Stearic Acid
Rufat
Cocoanut F. A.
Corn F. A.
Cottonseed F. A.
Linseed F. A.
Peanut F. A.
Soya F. A.
Tallow F. A.

White Mineral Oil - Petrolatum - Superfatting Agent

VODOL A maize phosphatide which lowers surface and interface tension of oils and fats, stabilizes and prevents reversion, increases penetration and spread.

Soda Ash
Caustic Soda
Modified Soda
Sodium Metasilicate

Trisodium Phosphate
Disodium Phosphate
Monosodium Phosphate
Tetrasodium Pyro Phosphate

THE LAMEPONS unique surface active agents; prolific foam; high detergency and emulsifying powers; suitable for cosmetic and industrial use.

QUADRAFOS a stable polyphosphate for water conditioning and mild but effective detergency.

Starch and Dextrine

WELCH, HOLME & CLARK CO., INC.
563 GREENWICH STREET, NEW YORK 14, N. Y.

Are you informed about the *new* Titanium Steel for Vitreous Enameling

?

LABORATORY-TESTED and plant-proved are the advantages of this *new* Titanium steel to manufacturers of vitreous enamel products, when recommended practice is followed in steel making, pickling and enameling.

By removing source of reboil in the stock, large cost reductions are possible. Ground coat can be eliminated and conventional cover coats may be applied directly. Sagging is minimized, and hydrogen penetration is sharply reduced.

Lighter weights of enamel are possible, yielding a greater resistance to thermal shock. Drawing properties are equivalent to that of the best drawing steel.

Manufacturers of both steel and enameled products may obtain complete technical data from a member of our Technical Staff. Consult your steel supplier for deliveries.

Pending patent applications on the new enameling process and product made thereby are owned jointly by Inland Steel Company and The Titanium Alloy Manufacturing Company under Trust Agreement.

THE TITANIUM ALLOY MANUFACTURING COMPANY

Executive Offices: 111 BROADWAY, NEW YORK, N. Y. *General Offices and Works:* NIAGARA FALLS, N. Y.

NEW PRODUCTS & PROCESSES

25-Year-Old Chemical Finds Use as Detonator NP 135

Just as DDT, which was described decades ago, was rediscovered only a few years ago as a superior insecticide, so has another chemical, patented in 1920, found use as a detonator recently by scientists of the Bureau of Mines.

The compound, *cyclo*trimethylenetrinitramine, known more commonly as "hexogen" or "cyclonite," has been found more efficient than mercury fulminate, tetryl, or pentaerythritol tetranitrate.

A detonator consisting of a priming charge of an 80-20 lead azide-lead styphmate mixture and a base charge of hexogen was found to possess 5½ times the initiating efficiency of a fulminate-chlorate detonator, based on equal weights of explosive.

Brush Bristles From Casein NP 136

Researchers at the Eastern Regional Research Laboratory have succeeded in making quality paint-brush bristles from casein, a development prompted by the present shortages of pig bristles and coarse animal hairs.

Commercial acid-precipitated casein is heated with water to a plastic mass and extruded through a die. Then it is stretched and hardened under tension with quinone alone, or quinone followed by formaldehyde, to increase resistance of the bristle to water. The fibers in the diameter range of 0.2 to 0.6 mm. vary from soft and pliable to stiff.

Experimental brushes made with these bristles have good paint-carrying capacity, make smooth films, and have good wear resistance. They are resistant to oils and fat solvents, but soften in water.

Milkweed Resin NP 137

Pod hulls of *Asclepias syriaca L.*, when cooked in 1.5% sodium hydroxide solution at 15 lb. steam pressure for 30 minutes, washed to pH 9 on a Trommel screen, and agglomerated in pebble mills, yielded a gum containing 83.4% resin (acetone extract), 7.3% rubber (benzene extract), a small amount of water-soluble material, and 9% residue.

Glycerides of fatty acids (stearic and palmitic, 8%; oleic, 50%; linoleic, 40%; and linolenic, 2%) comprised 52-58% of the acetone extract. Five percent of hydroxy acids and small amounts of an essential oil and free fatty acids were present in the undried gum. Resin acids were absent. The unsaponifiable portion —(42-43%) contained 70% amyrin, and small amounts of sterol and wax. Calcium oxalate, soaps, and hexose were isolated from the aqueous extract. The residue consisted of lignin, cellulose, inorganic materials and a trace of protein.

China Wood Oil Substitute NP 138

Early in the war, shortages in China wood oil from the Orient were relieved by the development of dehydrated castor oil. Current castor oil shortages renew these difficulties. Spencer Kellogg and Sons, producers of vegetable oils for industrial uses, present, as a new product of chemical research to fill such needs, a modified linseed oil under the brand name "Kel-X-L." This oil is characterized by rapid bodying in the varnish kettle, compatability with resins including such less expensive resins as linseed rosin, and fast drying durable varnish films that are excellent in water and alkali resistance.

Menthylphenol NP 139

Menthylphenol, a new chemical which improves the heat and light stability of ethyl cellulose plastics, film, plastic peel, adhesives and paper coatings, is now commercially available, according to an announcement by Hercules Powder Company.

The chemical is a result of the extensive research in terpene chemicals being carried on by Hercules. Menthylphenol is a white, opaque, semiamorphous solid and can also be used as a plasticizer extender with cellulose acetate.

Research data shows that menthylphenol, formerly known as Stabilizer X, is outstanding in preventing ethyl cellulose plastics from becoming brittle and at the same time greatly minimizing the change of color of moldings.

Ethyl cellulose film containing menthylphenol possessed greater flexibility and considerably less surface cracking after exposure tests than film without stabilizer. The films were subjected to 60 days of outdoor summer exposure at Wilmington, Del.

The optimum amount of menthylphenol found useful with ethyl cellulose is one to three per cent based on total solids of the mix. Amounts less than one per cent do not have sufficient stabilizing effect, and amounts greater than three per cent do not appear to give any appreciable increase in stability.

Margaric Acid NP 140

Margaric acid, $C_{17}H_{34}O_2$, is now being produced by Columbia Organic Chemicals Co., Inc., by reacting cetyl bromide with sodium cyanide and hydrolyzing the resulting nitrile.

The pure acid melts at 60.5 deg. and boils at 227 deg. at 100 mm. pressure. It is very soluble in hot alcohol and almost insoluble in cold alcohol and water.

Margaric acid is of pharmaceutical interest in that its glyceride cannot give toxic acetone bodies on oxidation in the body such as are formed from the metabolism of fat in severe diabetes.

Samples will be furnished on request.

Chlorine Comparators NP 141

The research department of the LaMotte Chemical Products Co., of Towson, Baltimore, Md., has completed a survey of the improved application of chlorine in the form of free chlorine, hypochlorites and chloramines as sterilizing agents in the treatment of water for municipal supply, for sewage and a host of industrial uses. As a result of these studies, a complete new line of LaMotte chlorine control units have been made available paralleling the recent advances in the more ef-

CHEMICAL INDUSTRIES TECHNICAL DATA SERVICE

CHEMICAL INDUSTRIES, 522 Fifth Ave., New York 18, N. Y. (8-5)

Please send me more information, if available, on the following items. I understand that nothing further may be available on some of them.

NP 135	NP 139	NP 143	NP 147	NP 151
NP 136	NP 140	NP 144	NP 148	NP 152
NP 137	NP 141	NP 145	NP 149	NP 153
NP 138	NP 142	NP 146	NP 150	NP 154

Name ..... **(Position)** .....

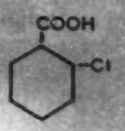
Company .....

Street .....

City ..... Zone ..... State .....

ORTHO CHLOR BENZOIC ACID

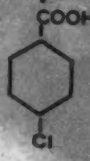
High melting, nearly white, coarse powder



Molecular Weight.....156.5
Assay (dry basis)..... 98.5%
Ash (maximum) 0.20%
Melting Point (minimum)....137.0°C.

PARA CHLOR BENZOIC ACID

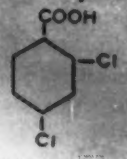
High melting, nearly white, coarse powder



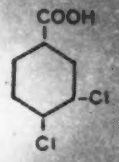
Molecular Weight.....156.5
Assay (dry basis)..... 98.5%
Ash (maximum) 0.30%
Melting Point (minimum)....238.0°C.

2,4 DICHLOR BENZOIC ACID

White to slightly yellowish powder



Molecular Weight.....191.
Assay (min on dry basis).. 98.0%
Ash (maximum) 0.20%
Melting Point .....158-162°C.



3, 4 DICHLOR BENZOIC ACID

White to slightly yellowish powder

Molecular Weight.....191.
Assay (min. on dry basis).. 95.0%
Ash (maximum) 0.20%
Melting Point .....205-207°C.

CHLORINATED BENZOIC ACIDS

USES—As intermediates for the preparation of anti materials, dyes, fungicides, pharmaceuticals and other organic chemicals.

Samples, technical data sheets and further information available upon request.

FINE HEYDEN CHEMICALS

HEYDEN *Chemical Corporation*

393 SEVENTH AVENUE, NEW YORK 1, N. Y.

Benzaldehyde • Benzoates • Benzoic Acid • Benzyl Chloride • Bromides • Chlorinated Aromatics • Medicinal Creosotes • Formates • Formaldehyde • Formic Acid • Glycerophosphates • Medicinal Guaiacols • Hexamethylenetetramine • Paraformaldehyde • Parahydroxybenzoates • Penicillin • Pentaerythritols • Salicylates

fective chlorination procedures. The latest recommendations of the Committee on Control of Chlorination of the American Water Works Association have been carefully followed, and a new series of standards have been prepared of a size interchangeable with the regular LaMotte pH color standards. An additional new development is the ortho tolidine-arsenite test, which makes it possible to measure separately chloramine and active chlorine and, furthermore, it is possible to estimate the error that is caused by other interfering substances. A pamphlet describing the ortho tolidine-arsenite test is available and should be of interest to all operators.

Plastics from Sugar NP 142

Manufacture of a plastic molding compound from a waste product of sugar factories and the use of sugar itself for the formation of plastics has been revealed in a report to the members of the Sugar Research Foundation, Inc. The report on "Sugar and Sugar By-Products in the Plastics Industry," prepared by Dr. Louis Long, research associate in chemistry at Massachusetts Institute of Technology, states in part:

"The advantages of sucrose as a plastic raw material are due to its almost unlimited supply as an inexpensive, very pure organic compound. Chemically, it has a number of reactive centers, enabling it to polymerize readily or react with other substances to form compounds which can be polymerized. To date, however, results have been of only theoretical interest because of the sensitivity of the molecule to heat and chemical treatment, causing it to discolor readily, and because of the difficulty of controlling the polymerization to produce desirable physical properties in the finished product. On the other hand, a certain degree of success has recently been attained in the formation of a plastic molding compound from bagasse, a waste product from sugar factories, and commercial production has begun on a small scale in Louisiana.

"Sucrose, and its hydrolysis products glucose and fructose, are potential raw materials for the formation of both colored and colorless plastics of either the phenolic or the alkyd type, the two resins produced in the largest quantity in this country. Sorbitol and mannitol, reduction projects of glucose and fructose, should find application as polyhydric alcohols for alkyd resins. Bagasse molding powders are useful in the thermosetting phenolic plastic field.

"The potential consumption of sugar or molasses for the production of lactic and citric acids to be used in the manufacture of plastic materials is already clearly outlined, and their actual consumption should increase rapidly in the near future. The application of the other acids under consideration—aconitic, levulinic, citraconic and itaconic—in the plastic field is not yet as well defined. The cheapest of these, levulinic acid, is available on a small scale in commercial quantities at a price which is low enough to make it an attractive plastic raw material, but it is evident that further research is needed to determine its most effective use. The recently announced improvement in the method of preparation of itaconic acid (*Ed Note:* CHEMICAL INDUSTRIES, Oct. '44, p. 600) should give a strong stimulus to investigations leading to its applications as a plastic ingredient.

The demand for esters of aconitic acid for use as plasticizers in connection with war materials is said to be greater than the supply, and if additional experimentation can make it more readily available, its utilization in the plastic field may become an important source of profit to the sugar industry."

Motor Fuels From Farm Wastes NP 143

A process for the chemical conversion of such agricultural residues as corncobs, sugarcane bagasse, peanut shells, flax shives, oat hulls and cottonseed hulls and burs into liquid motor fuel and other commercially valuable products is moving into the semi-works stage of experimentation at the Department of Agriculture's Northern Regional Research Laboratory at Peoria, Illinois.

Results of experimental laboratory investigations by Department chemists indicate that from 90 to 95 gallons of liquid motor fuel can be obtained from a ton of corncobs or cottonseed hulls and that about half of this is in the form of ethyl alcohol. A continuous process for the treatment (or saccharification) of corncobs and cottonseed hulls gave such promising results in the laboratory stage that the work is to be enlarged so that it may now be evaluated on a semi-commercial scale. This enlarged program calls for a new building with modern equipment and a staff of approximately 15 scientists.

Mold Storage NP 144

A small, home-model, quick freezer with a capacity of 5 cubic feet could hold for long-time preservation four specimens of the molds that are the bases for manufacture of pencillin and also of more than 3,800 strains of other molds, yeasts and bacteria that make up the working collection of these organisms at the Department of Agriculture's Northern Regional Research Laboratory at Peoria, Ill. Frozen, dried, and sealed in small vacuum tubes by what is known as the "lyophil process," the spores of these fermenting agents could be stored with a minimum danger of loss.

The lyophil process of preservation also promises material economy in maintaining this working collection of ferments. Under previous practice it has been necessary for scientists and highly skilled laboratory technicians constantly to devote time to the routine culturing of these valuable molds and other organisms, plating them on sterilized agar, protecting them against contamination, and, even then, taking the risk of accidental losses.

The first of this work was done in 1941, and proved so promising that all the strain in the collection which seemed suitable were processed in 1942. Many of the processed strains have been tested for ability to reproduce after increasing periods of storage. After 41 months most of the molds—including the penicillin-producers—emerged from storage unaltered and able to grow normal colonies. In none did the investigators note any alteration of the characters of the new growth as compared with those kept in the laboratory by routine culturing.

Protective Creams NP 145

Two new protective creams have been introduced by Cadet Laboratories under the trade-names "Hand Saver" and "Sealskin." The former is said to offer protection against irritations caused by mineral, vegetable, and animal oils, hydrocarbon and chlorinated solvents, and cutting oils and compounds containing not more than 10 per cent water. It also guards against glues, tar, paint, etc., and acts as a cleaner.

The latter is compounded with a lanolin base and resists water-soluble irritants such as acids and alkalies as well as petroleum solvents and a host of organic and inorganic irritants.

Evans Produces Commercial Thioglycollates NP 146

Commercial shipments of distilled thioglycollic acid in concentrations of 90-95% as well as ammonium thioglycollate in the same concentrations are now being produced by the Waterloo Plant of Evans Chemetics, Inc., of New York, N. Y.

Due to increased demands for these and other of the mercaptans, it has been possible to reduce prices to a point where many new uses for these compounds are anticipated.

Softening Agent Improves Yarns NP 147

United States Letters Patent No. 2,380,003 was granted to Celanese Corporation of America recently.

According to this patent, strong yarns of stretched, saponified cellulose acetate or other organic esters of cellulose are twisted or otherwise associated with thermoplastic yarns having a basis of cellulose acetate to form a composite yarn. This composite yarn is then subjected to the action of vapors of a softening agent for the thermoplastic material. Preferably, the associated yarns are subjected to a vacuum prior to being exposed to

SPIRALING UP INTO NEW FIELDS OF USES

KELCO ALGIN

In the Food, Pharmaceutical and Industrial fields, KELCO ALGIN continues to find more and more new applications — as STABILIZER, SUSPENDING AGENT, THICKENER or BODYING AGENT and HYDROPHILIC COLLOID.

That's because KELCO ALGIN is uniform and helps give predictable uniform results in any given use. Unlike other nature products which vary in response to their changing conditions of growth or environment, KELCO ALGIN is a pure and stable seaplant derivative which is easily controlled and confined to whatever definite standards may be established for its application.

There's a strong probability that KELCO ALGIN can improve both the processing and marketability of your food, pharmaceutical or industrial product. Our Technical Department is at your service — gratis. Simply write us your intended use.

KELCO
REG. U.S. PAT. OFF.
REFINED ALGIN PRODUCTS

KELCO COMPANY

75 E. Wacker Drive
CHICAGO-1

31 Nassau Street
NEW YORK-5

530 W. Sixth Street
LOS ANGELES-14

the vapors of the softening agent. As a result of this process, it is possible to obtain flexible, permanently compact, composite, bonded yarns of unusual strength.

Supersonics Detects Rocket Powder Flaws NP 148

An improved method of examining rocket powder grains using high frequency sound waves has been developed by Hercules Powder Company research engineers.

The examination of the interior of rocket powder grains for the presence of voids is one of the most important steps in the manufacture of rocket powder.

Supersonic waves of very high frequency generated by a crystal connected to a specially designed electronic circuit are passed through a rocket powder grain. These grains are from five inches to five feet long.

If the grain has a flaw, a minute air space, under the surface, a certain percentage of the supersonic sound waves will be deflected from a known course. This deflection is recorded on a meter which is connected to a receiving crystal.

Before this new inspection method was perfected, large X-ray pictures were taken of each powder grain. However, the output of rocket powder increased so rapidly that in March, 1944, it became apparent there would not be enough X-ray film produced in this country to supply the demand when production hit its peak.

The supersonic method reduces the number of operations required to inspect a rocket powder grain, is much less expensive to use, and is more sensitive in detecting flaws than the previous method.

Hercules research engineers began investigation of the possibilities of using supersonic waves in March, 1944, and after deciding the method was feasible, asked the Brush Development Company, Cleveland, Ohio, to build supersonic generating and receiving equipment.

After joint experimentation by Hercules and Brush engineers, equipment was perfected to handle powder inspection on a production basis.

Fire-Resistant Upholstery Fabric NP 149

A fire-resistant, plastic-coated upholstery fabric, developed for aircraft, tanks, and ships, and expected to find wide postwar usage in boats, restaurant seats, and office furniture has been announced by the Du Pont Company.

The fabric consists of a flameproofed cotton cloth base with a flexible fire-resistant surface coating of synthetic resin. The material will char in contact with a flame but will not support combustion. When the flame is withdrawn, there is no after-glow. The fabric was described as being so pliable it would not crack in a flexing machine test at 30 degrees below zero.

The biggest problem was to discover the proper combination of fire-inhibitive softeners which would also impart good flexibility to the coating. Three plasticizers are used.

The material, known as P. C. "Cavalon" plastic-coated fabric, will be available in a range of colors, grains, and finishes when war demands are met, the announcement said.

Plastic Filler NP 150

Irvington Varnish & Insulator Co. has introduced a cold-setting plastic to be used as a filling material for junction boxes, stuffing boxes, pot-heads and similar void spaces encountered in electrical work. Known as Cardolite 5616, this liquid resin is mixed with Irvington 5612 Setting Agent prior to use. Approximately four hours after mixing, the two ingredients will gel at room temperature to the point where flow is no longer possible, and after several days, the end product is a tough rubbery mass which will not flow under heat nor become brittle in the cold. The set compound is insoluble in water, oil, acids and alkalies. Although Cardolite 5616 will adhere to metal, it can be stripped away cleanly to allow repairs to terminals and cable strips.

Originally made for filling junction boxes on marine cable installations, Cardolite 5616 is now of interest in all applications where a free flowing material is required which will set to form a rubbery solid.

Goggle Cleaner NP 151

Hazards created by cloudy goggles are reduced by the liquid goggle cleaner station announced by the Allen Optical Co.

The station is a steel atomizer cabinet for application of the Sani-Spray Goggle Cleaner. The cabinet holds a refillable quart jar of Sani-Spray, a supply of tissue paper, and a built-in receptacle for used cleaning tissues.

Simple push-button control releases a fine mist of Sani-Spray from an orifice on one side of the cabinet, pressure being provided by connecting to the plant air line. An adjustable control valve regulates the predetermined amount of spray that is applied to the goggles.

The goggle cleaner not only cleans but also fog-proofs goggles, eliminating the inefficiences caused by distracting fog and moisture on goggles.

Determining Surface Moisture of Coal NP 152

A rapid method for determining the surface moisture of coal—an important controlling factor in making coke in by-product coke ovens—has been developed by Bureau of Mines Research workers at

Try These

AMECCO CHEMICALS *Now!*

PLASTICIZER No. 8

For Vinyl Resins

INEXPENSIVE
LOW MODULUS
READILY AVAILABLE
EXCELLENT LOW TEMPERATURE FLEXIBILITY

Write for a sample and further information.

AMECCO CHEMICALS INC.

NEW YORK SALES OFFICE • MAIN OFFICE AND PLANT
60 EAST 42nd STREET, NEW YORK 17, N.Y. 75 ROCKWOOD STREET, ROCHESTER 10, N.Y.
ESTABLISHED 1919

THREE NEW PRODUCTS
from Columbia Research Laboratories

Butyl Diglycol Carbonate
Diethylene Glycol Bis(n-butylcarbonate)

$(C_4H_9-O-CO-O-C_2H_4-)_2O$

Butoxyethyl Diglycol Carbonate
Diethylene Glycol Bis(2-n-butoxyethylcarbonate)

$(C_4H_9-O-C_2H_4-O-CO-O-C_2H_4-)_2O$

Phenyl Diglycol Carbonate
Diethylene Glycol Bis(phenylcarbonate)

$(C_6H_5-O-CO-O-C_2H_4-)_2O$

Butyl Diglycol Carbonate, Butoxyethyl Diglycol Carbonate, and Phenyl Diglycol Carbonate are new colorless organic ether-esters of low volatility. They are substantially insoluble in water and are very stable to hydrolysis by water. They can yield only neutral products and carbon dioxide when hydrolyzed. The new compounds are widely soluble in organic solvents, and are compatible with many resins and plastics. The properties of these Diglycol Carbonate esters suggest that they may be used to advantage as plasticizers, high-boiling solvents, and softening agents, as well as in pharmaceutical and lubricant compositions.

Principal properties are shown below.

Additional Data on Request

Technical Bulletins containing additional information are available through our General Sales Offices. These data may indicate potentialities for your products. You can obtain samples—at no charge—for use in your laboratories.

PROPERTIES OF DIGLYCOL CARBONATE ETHER-ESTERS

Property	Butyl Diglycol Carbonate	Butoxyethyl Diglycol Carbonate	Phenyl Diglycol Carbonate
Formula	$C_{14}H_{26}O_7$	$C_{18}H_{34}O_9$	$C_{18}H_{18}O_7$
Molecular Weight	306.4	394.5	346.3
Physical State	Liquid	Liquid	Solid,m.p.40°C.
Sp. Gr., 20°C./4°C.	1.08	1.08	1.23
Refractive Index, 20°C.	1.437	1.443	1.525
Viscosity, centipoises at 20°C.	14	22	1370 (Supercooled)
Boiling Point, °C.	175 (3mm. Hg.)	215 (4mm. Hg.)	—
Flash Point, °F.	372	390	460
Evaporation Rate at 100°C., mg./sq. cm./hr.	0.59	0.12	0.026

COLUMBIA CHEMICALS

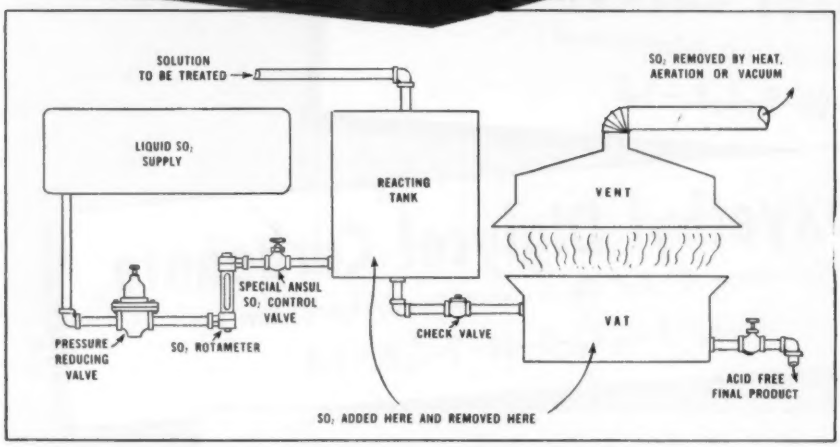
PITTSBURGH PLATE GLASS COMPANY • COLUMBIA CHEMICAL DIVISION

GRANT BUILDING, PITTSBURGH 19, PENNSYLVANIA

Chicago • Boston • St. Louis • Pittsburgh • New York • Cincinnati • Cleveland • Philadelphia • Minneapolis • Charlotte • San Francisco

EVAPORATE
EXCESS ACIDITY

Use ANSUL SO_2 as an acidifying agent and remove excess by heat, aeration or vacuum



Here is a typical SO_2 acidifying and precipitating system showing how the SO_2 is introduced and excess acidity removed.

• Ansul SO_2, a volatile acid, provides distinct advantages over mineral acids when used as an acidifying and precipitating agent. 1—Excess acidity is easily eliminated. 2—Residual acidity that might otherwise be concentrated as an impurity in the final product is minimized.

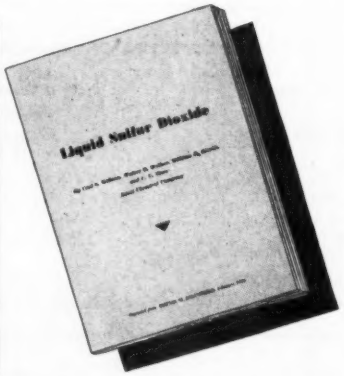
Ansul Liquid SO_2 is pure, inexpensive—easy to handle. It has unusual bleaching and preservative qualities and its use results in products of greater purity.

LIQUID Sulfur Dioxide by ANSUL

PHYSICAL PROPERTIES

Chemical formula	SO_2
Molecular weight	64.06
Color (gas and liquid)	Colorless
Odor	Characteristic, pungent
Melting point	−103.9° F. (−75.5° C.)
Boiling point	14.0° F. (−10.0° C.)
Density of liquid at 80° F.	(85.03 lbs. per cu. ft.)
Specific gravity at 80° F.	1.363
Density of gas at 0° C. and 760 mm.	2.9267 grams per liter (0.1827 lb. per cu. ft.)
Critical temperature	314.82° F. (157.12° C.)
Critical pressure	1141.5 lbs. per sq. in. abs.
Solubility	Soluble in water
Purity	99.9+% (by wt.) SO_2 (H_2O less than 0.01%)

*REG. U. S. PAT. OFF.



Send for your copy of "Liquid Sulfur Dioxide"—a treatise on the properties, characteristics, and industrial uses of Liquid Sulfur Dioxide—written by the Ansul Technical Staff.

ANSUL CHEMICAL COMPANY, MARINETTE, WIS.
Eastern Office: 60 E. 42nd St., New York City

the Pittsburgh, Pa., experiment station, according to a publication released by Dr. R. R. Sayers, Bureau Director.

By means of a relatively simple apparatus, a measured sample of the coal to be tested is placed in a solvent such as alcohol and the surface moisture is dissolved. The solvent then is filtered from the coal and its moisture content is determined by measuring the dilution of the solvent by its change in specific gravity.

Although still in the development stage, numerous requests for a description of the method prompted the Bureau to issue a preliminary report at this time, Dr. Sayers stated. It is believed that the method is accurate enough for practical purposes and that it will be of considerable help in solving some of the problems of the coal and coking industries.

L. D. Schmidt and William Seymour, Bureau engineers who prepared the report, state that the method has been in use for more than a year at Pittsburgh and that it has proved satisfactory. Little skill is required to operate the simple equipment used, and the time needed for measuring the surface moisture of a given sample of crushed coal is about 15 minutes compared to several hours for the ordinary determination in drying ovens.

Cleaning and Descaling Compound NP 153

Pennsalt PM-90, a specially prepared acid cleaning and descaling compound, has recently been developed by the research and development department of the Pennsylvania Salt Manufacturing Company.

Pennsalt PM-90 contains addition agents for surface action and inhibition. It is primarily used as a pickling bath concentrate in electroplating shops and as an acid cleaner for removing water scales from boilers and industrial equipment.

Carbon Remover NP 154

Phillips Chemical Company, makers of industrial and maintenance chemicals, has introduced Carbo-Blitz, a new high-efficiency, super-speed carbon remover.

Carbo-Blitz is non-flammable, non-toxic, and non-injurious to the worker or the work. It is used cold, in any container and is entirely safe for all types of metals and alloys.

Actual comparative tests on identical carbonized pistons, both ferrous and non-ferrous, Diesel engine valves and other badly carbonized test pieces show that this material operates safely and efficiently at from 5 to 10 times the speed of ordinary carbon removers, with no need for scraping or wire brushing and consequent danger of injury to surfaces. In other actual shop tests, deposits that still resisted removal after 12 hour soak in other carbon removers were completely cleaned in from 1 to 2 hours, the manufacturer said.

For Quality Products use Hooker Sulfides in Reactions Like These

In addition to the regular properties of Sodium Sulfide and Sodium Sulfhydrate which make them valuable reagents, another property of the Hooker Sulfides makes these Hooker products first choice among users. The Hooker Sulfides are of a special high quality and purity with extremely low iron content, an important factor in many reactions. The economy of eliminating a settling stage is a further advantage in the use of Hooker Sulfides. Some of the more general and typical uses of these sulfides are given below.

For Organic Sulfides and Disulfides

Sodium Sulfide is widely used in the making of organic sulfides and in conjunction with added sulfur, disulfides are obtained. Examples of this use are in the preparation of benzyl disulfide and diamyl sulfide. In the preparation of the latter, the purity of Hooker Sodium Sulfide results in a high quality product which in turn is used as an intermediate in the production of white solids such as diamyl sulfone, sulfoxide and sulfonium halides.

$$2C_5H_{11}Cl + Na_2S = (C_5H_{11})_2S + 2NaCl$$
$$(C_5H_{11})_2S + O_2 = (C_5H_{11})_2SO_2$$
$$2(C_5H_{11})_2S + O_2 = 2(C_5H_{11})_2SO$$
$$(C_5H_{11})_2S + CH_3I = [(C_5H_{11})_2SCH_3]I$$

For Mercaptans

Reacting alkyl halides with Sodium Sulfhydrate produces mercaptans. An example of this reaction is amyl mercaptan made from amyl chloride according to the following equation:

$$C_5H_{11}Cl + NaSH = C_5H_{11}SH + NaCl$$

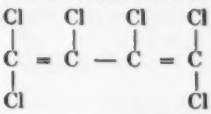
While aryl halides do not enter into this type of reaction, mercaptans of the aromatic series may be made through the reaction of the sodium salts of sulfonic acids with Sodium Sulfhydrate. The preparation of phenyl mercaptan in this way is shown by the following equation:

$$C_6H_5SO_3Na + NaSH = C_6H_5SH + Na_2SO_3$$

The purity of Hooker Sodium Sulfhydrate, especially its freedom from iron is an important factor in these reactions.

CHEMICAL OF THE MONTH

HEXACHLORBUTADIENE



A recent development of the Hooker Research Laboratories and one that is evoking interest among chemists working with natural and synthetic rubber and plastics is Hexachlorbutadiene. Its solvent properties, high boiling point and noninflammability make it valuable for many other uses.
Hexachlorbutadiene, a clear colorless liquid with a mild characteristic odor, is insoluble in water and soluble in alcohol, ether and most chlorinated solvents. It is highly stable and is resistant to hydrolysis by water or mild alkalis.
Among resins found to be compatible with Hexachlorbutadiene are chlorinated rubber, natural asphalt, polyvinyl chloride, vinyl acetate and vinyl polymer.
Technical Data Sheet No. 332 describes the physical properties of Hexachlorbutadiene. Research samples will be supplied when requested on your business letterhead.

For Thioglycols, Thio Acids

Because of the presence of two-OH groups in glycols, two types of sulfur derivatives are possible, those in which one oxygen has been replaced by sulfur and those in which both have been replaced.

$$HOCH_2CH_2Cl + NaSH = HOCH_2CH_2SH + NaCl$$
$$ClCH_2CH_2Cl + 2NaSH = SHCH_2CH_2SH + 2NaCl$$

Reacting hydroxy acids with Sodium Sulfhydrate produces thio acids as for example, thiosalicylic acid from the diazonium chloride of salicylic acid:

$$N_2ClC_6H_4CO_2H + NaSH = HSC_6H_4CO_2H + N_2 + NaCl$$

or thioglycolic acid from monochlor acetic acid.

$$CH_2ClCOOH + NaSH = CH_2SHCOOH + NaCl$$

Sodium Sulfhydrate is used in the preparation of those true thio acids, where one or both of the atoms of oxygen in the carboxyl group are replaced. The preparation of thiobenzoic acid from benzoyl chloride and dithiobenzoic acid from benzotrichloride:

$$C_6H_5COCl + NaSH = C_6H_5COSH + NaCl$$
$$C_6H_5CCl_3 + 2NaSH = C_6H_5CSSH + 2NaCl + HCl$$

For Sodium Thiosulfate

Sodium thiosulfate or hypo is made by reaction of Sodium Sulfide or Sodium Sulfhydrate and sulfur dioxide. Three of the equations that can be written for this reaction are:

$$2\,Na_2S + 3SO_2 = 2Na_2S_2O_3 + S$$
$$2\,Na_2S + 2SO_2 + 2NaHSO_3 = 3Na_2S_2O_3 + H_2O$$
$$2\,NaSH + 4NaHSO_3 = 3Na_2S_2O_3 + 3H_2O$$

These chemicals also have special use in the cosmetic, metallurgical, photographic, textile and dyeing fields. Our technical staff is ready to help you in the application of these and other Hooker chemicals to your particular problems. Data sheets and samples on any of these Hooker chemicals will be sent you when requested on your letterhead.

HOOKER ELECTROCHEMICAL COMPANY
3 Forty-Seventh Street
NIAGARA FALLS, NEW YORK
New York, N. Y. Tacoma, Wash.
Wilmington, Calif.

ARMY E NAVY

HOOKER CHEMICALS

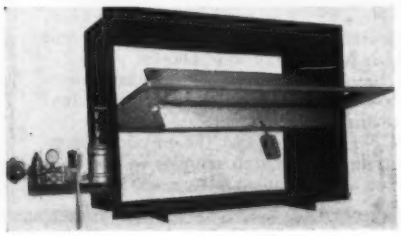
Caustic Soda	Muriatic Acid
Paradichlorbenzene	Chlorine
Benzotrichloride	Benzoyl Chloride

8322

NEW EQUIPMENT

Smoke Control QC 600

A new double damper smoke control shown during the "off period," now being manufactured by Campbell Engineering Co., and marketed under the trade mark "Stackmaster." This new double damper



is made in various sizes, size being determined after an engineering survey of the stack and boiler performance. Its function is to adjust the smoke stack to daily weather conditions for the elimination of excess smoke, reduction of excess stack temperatures, maintenance of uniform volume of draft and to decrease combustion fuel losses.

The "Stackmaster" is said by the manufacturer to effect a saving in fuel cost from 5 to 50%. The "Stackmaster" is installed with either electric, hydraulic, or pneumatic control system so that it may be designed to meet practically all conditions where there are excess smoke and combustion losses.

Smoke Detector QC 601

A photoelectric system now available from Photoswitch, Inc., detects the presence of smoke in air conditioning ducts and immediately sounds alarms, turns off blowers, operates automatic dampers, providing the required control.

The system consists of Photoelectric Control Type A26X and Light Source Type L11RX. The latter may be mounted to project a beam of light over any distance from 10 to 25 feet to the "eye" of the photoelectric unit. A sensitivity adjustment on the light source housing, permits variation in the intensity of the light beam, enabling the photoelectric control to respond to smoke of a predetermined density. Type A26X will then remain inoperative at any other level of illumination, but will be actuated when smoke haze sufficiently reduces the amount of light reaching the phototube. To provide complete protection, Type A26X is so designed that either current or tube failure will cause the control to operate.

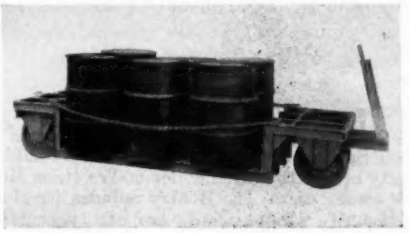
Both units are available either in Underwriter - approved explosion - proof housings for mounting in Class 1 Group D hazardous areas, or in weather-proof pressed steel housings. Type A26X operates from a supply of 115 volts A. C. 60

cycles and incorporates a single-pole double-throw relay for normally open or normally closed operation. Relay contacts are pure silver, designed to handle 10 amperes A. C. or 5 amperes D. C. at 115 volts. When using external power, a maximum of 230 volts may be used on the contacts providing 1100 watts A. C. or 550 watts D. C. is not exceeded. Larger currents or higher voltages can be controlled through use of an auxiliary power relay.

The system should require no maintenance other than normal vacuum-tube and light-source lamp replacement.

Easy-Loading Trailer QC 602

The underslung design of the new easy-loading trailer of the Palmer-Shile Company drops the platform down to within 6¼ inches from the floor, providing an



exceptionally low center of gravity for easy loading from floor, skid or rack.

On a roomy platform, 38″ wide by 78″ long, heavy loads roll easily and safely on heavy rubber-tired metal wheels. Drums, barrels or other loads liable to shift, are held secure by strong chains.

The trailer has an all-welded structural steel framework, strongly braced and heavily reinforced to handle loads of 2½ tons safely. Exclusive of draw-bar (40″ long) the overall length is 126″.

Tube Cleaner QC 603

The Spartan Tool Co. has announced the introduction of a self-contained power-driven tool for cutting and removing obstructions, stoppages, slush or scale from curved or fitted pipes, and tubing.

The machine is designed to house and drive ½″ x 100′ of flexible steel shafting. The flexible rod automatically coils and uncoils as it is fed into and from the container. The driving mechanism is a

motor-driven head which is removable from the stand. In operation, this driving unit is held at the opening of the pipe or tube so that the desired length of flexible rod may be fed into the pipe.

For removing waste material or scale the flexible rod is equipped with an elliptical shaped, spring steel, cutter head

CHEMICAL INDUSTRIES TECHNICAL DATA SERVICE

CHEMICAL INDUSTRIES, 522 Fifth Ave., New York 18, N. Y. (8-5)

Please send me more detailed information on the following new equipment.

QC 600	QC 603	QC 606	QC 609
QC 601	QC 604	QC 607	QC 610
QC 602	QC 605	QC 608	QC 611
			QC 612

Name ..... (Position) .....

Company .....

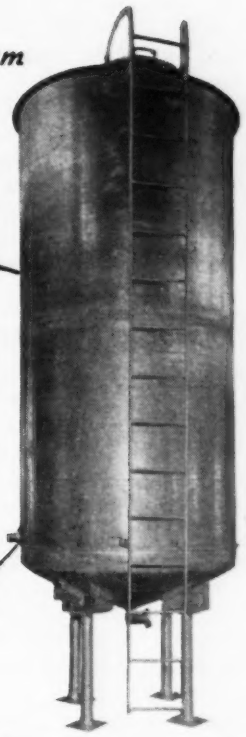
Street .....

City & State .....

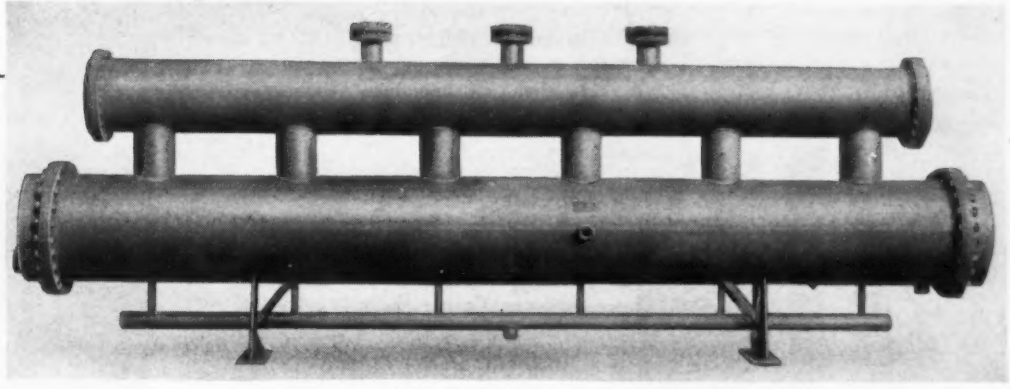
PATTERSON-KELLEY
Heat Exchangers
AND
Process Equipment

Skilled in the Red and White Metals

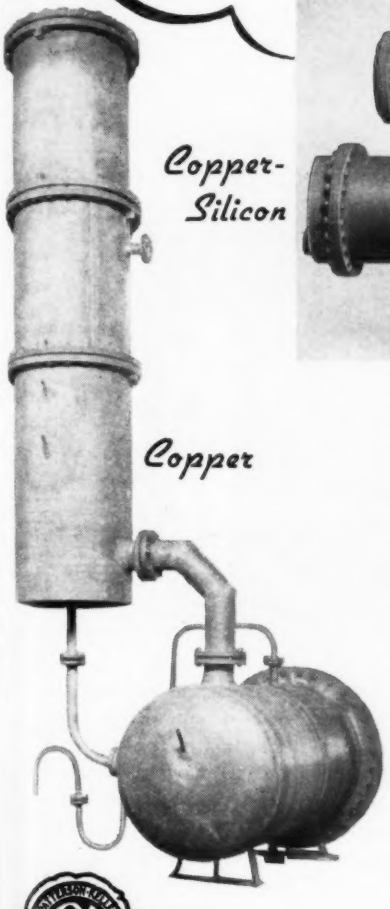
Aluminum



Copper-Silicon



Copper



Copper, aluminum, and copper-silicon alloy are represented in these three Patterson-Kelley process units. Our engineers, thoroughly familiar with the ferrous metals, also know the red and white metals and how to design equipment to make the best use of their respective qualities. Our shopmen are well-experienced in working with them.

If your equipment requirements call for copper, copper-silicon alloys, aluminum or any other non-ferrous metal, we can serve you and serve you well.

We are in a position to help in the design. If drawings are ready, we'll be glad to check for possible conflictions with accepted construction standards and quote on the manufacture. In considering this matter, remember that we have had many years of experience in the design and manufacture of heat transfer equipment of all kinds. Our original heat exchangers date back to 1880.

ARMY E NAVY

THE PATTERSON-KELLEY Company, Inc.

Main Office and Factory 111 WARREN STREET, EAST STROUDSBURG, PA.

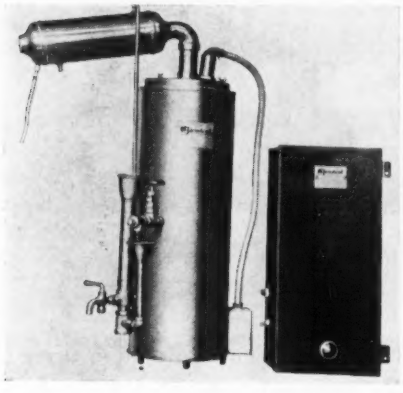
BOSTON 16, 96-A Huntington Avenue • NEW YORK 17, 101 Park Avenue • PHILADELPHIA 3, 1700 Walnut Street • CHICAGO 4, Railway Exchange Building

as shown in the illustration. The flexible shafting normally rotates the cutter head at 300 r. p. m. through the line regardless of the number of 90° elbows or T's therein. Upon encountering resistance from obstruction within the cylindrical opening, the effect of the flexible rod is to store up energy until the accumulated torque overcomes the resistance. The release of such torque load may spin the cutter at speeds approximating 750 r. p. m.

Water Cut-off QC 604

The Barnstead Still & Sterilizer Co., Inc., announce a new floatless low water cut-off for their electrically-heated water stills. The cut-off automatically shuts off the electricity if the water level in the evaporator drops below the proper operating level. An important feature of the new cut-off is the remote control cabinet which may be mounted in any convenient place regardless of the still location. This makes it easy to start and stop the still and to reset the cut-off, which operates on alternating current.

There are no moving parts inside the still and no float or float-chamber is employed. The cut-off acts positively and



requires no maintenance. It operates on a weak current flowing through an electrode rod into the water in the evaporator. When the water drops below the end of the rod the circuit is broken and a magnetic switch shuts off the electricity.

The remote control cabinet houses the relay and magnetic switch, starting switch, reset button, and has a convenient pilot light on the cover to indicate when the still is running. It requires only a simple electrical connection to the still.

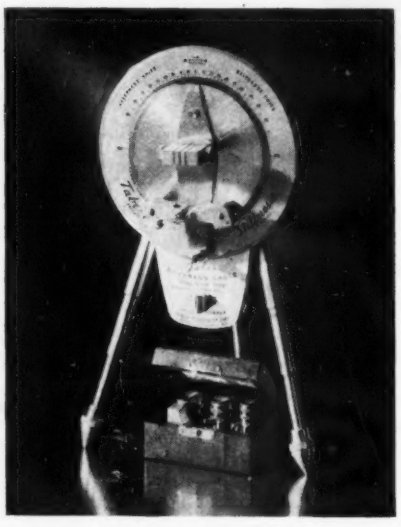
Floatless cut-offs for gas-heated stills are also available.

Stiffness Gauge QC 605

The Taber Instrument Corp. has just announced a new Taber V-5 Power Driven Stiffness Gauge for determining standard measurements of the stiffness and resilient qualities of flexible materials up to ⅜" in thickness, such as laminated plastic, cardboard, light metal sheet and wire.

The new instrument without the addition of attachments will measure both initial and normal stiffness characteristics. Elastic drift or "creep" of the specimen structure can be charted from the various readings.

The calibrated weighing system is of the pendulum type, and except for the



calibration weight, made of strong aluminum alloy, keeping inertia and bearing friction to a minimum. The face of the specimen clamp is mounted exactly on the center of rotation insures constant test length of the specimen, resulting in accurate and comparable test data.

A set of calibrated weights are furnished with the instrument consisting one each calibrated in 500, 1,000, and 2,000 Stiffness Units. Weights of 3,000 and 5,000 Stiffness Units are also available. An attachment is provided for measuring the flexual strength of very thin and flexible materials below 10 units stiffness.

The instrument is portable, weighing only 15 pounds, and can be plugged into any 115 volt, 60 cycle circuit in the laboratory or plant.

Water Heater QC 606

The new ADSCO Type R Water Heater of the American District Steam Company is for use with a gravity recirculation system, or where minimum friction loss in the water space is desirable,

and consists of a steel shell and 1¼" OD No. 16 BWG Copper U-tube removable heating element. The steam flows through the tubes, heating the water in the shell. It has numerous applications in commercial and industrial buildings such as providing hot water for domestic use, for process equipment in cooking, sterilizing or cleaning operations. It may be used also as a converter to heat water in a conventional hot water heating system or in connection with radiant heating installations and is available in 22 sizes.

De-Ionization QC 607

Use of a De-Ionization System introduced by the Dorr Company produces mineral-free water that is the chemical equivalent of distilled water in purity. The output can be regulated to control the exact degree of softness, purity, or mineral content.

Operating under commercial conditions, the Dorrco D-I System has yielded specification water at from 2¢ to 20¢ per 1,000 gallons, costs varying with the mineral concentration of the raw water. In comparison with costs of distilled water, commonly ranging from 65¢ to $8.00 per 1,000 gallons, the D-I System demonstrated a consistent savings in water costs of between 90 and 98 per cent.

A silica-free exchange material of high mechanical and chemical stability is used, making long "runs" between regeneration possible. Operation periods may be selected to coincide with availability of operators.

Suggested fields for the D-I System include: rayon manufacturing, plating,

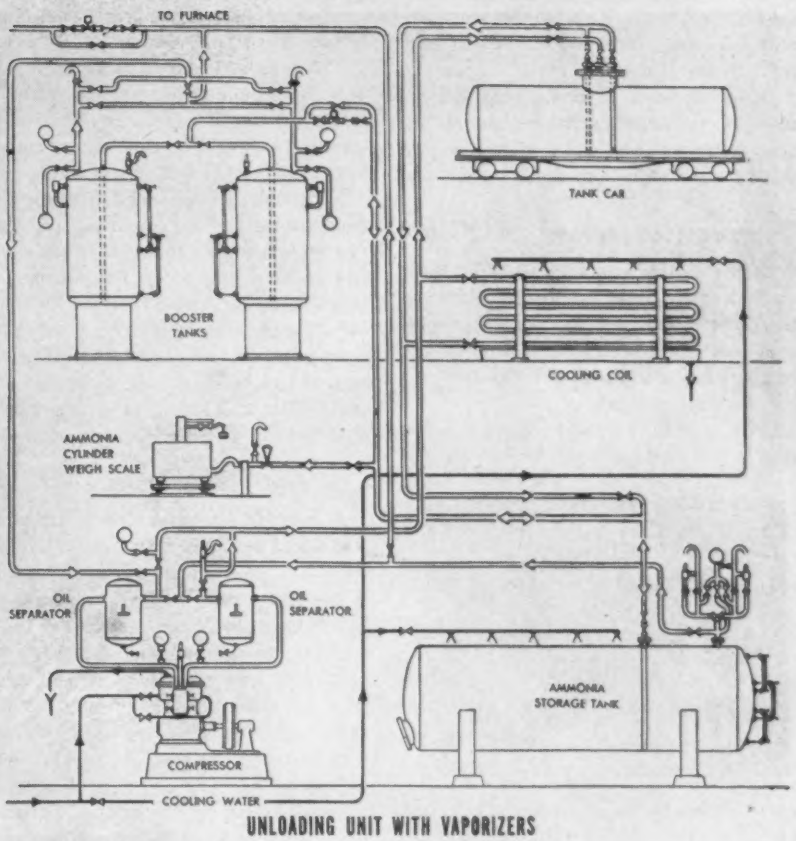
paper and pulp, brewing and food processing, pharmaceuticals, ceramics, and others. Varied applications in the treatment of water are removal of simple hardness, reduction of bicarbonate alkalinity and total solids, and the recovery of valuable metals from waste water.

Units are now available for use in plants consuming a few gallons of water a day in laboratory use, and for plants where daily water consumption runs into millions of gallons.

By means of simple controls, processing of water takes place in the D-I System in two steps. The first stage passes raw water over a bed of exchange material that removes calcium and magnesium

HANDLING LIQUEFIED GASES

BLAW-KNOX PLANTS ARE SERVING INDUSTRY



UNLOADING UNIT WITH VAPORIZERS

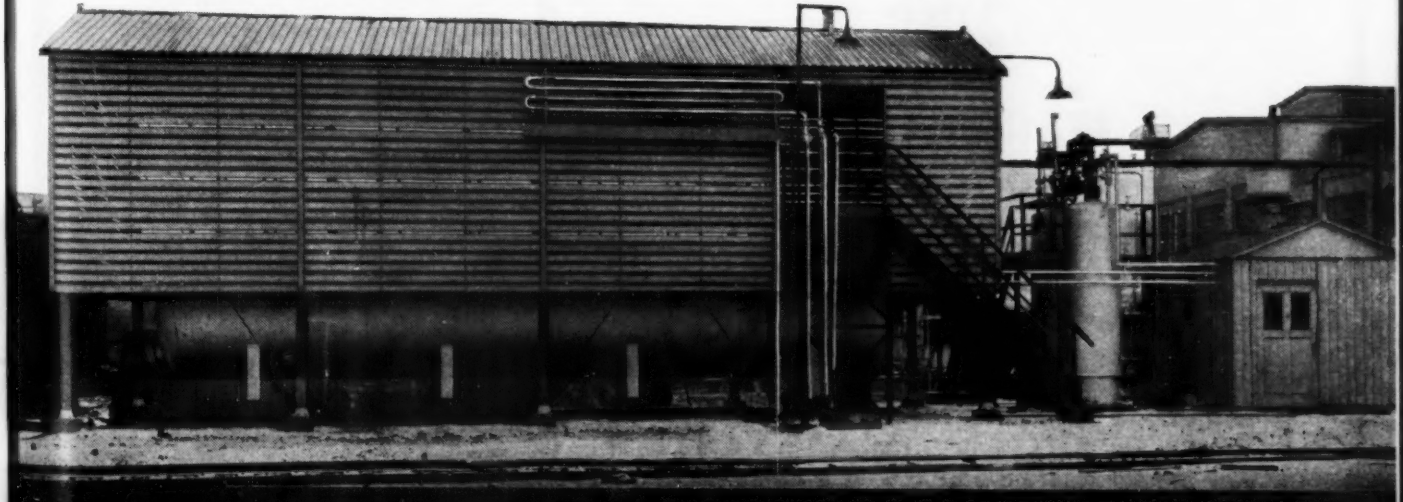
Ammonia, Carbon Dioxide, Chlorine, Methyl Chloride, Butane, Propane, and Butadiene are handled by Blaw-Knox plants for liquefied gases.

Blaw-Knox storage and handling systems for liquefied gases are serving industry in its wartime production achievements.

The storage system for liquefied anhydrous ammonia shown in the accompanying illustrations is just one of the scores of systems furnished by Blaw-Knox for industries of all types.

We invite you to submit your liquefied gas storage and handling problem to our engineering staff who are prepared to offer an economical system of standard or special design.

BLAW-KNOX DIVISION of BLAW-KNOX CO.
2093 Farmers Bank Bldg., Pittsburgh, Pa.
New York • Chicago • Philadelphia • Birmingham • Washington



BLAW-KNOX PROCES EQUIPMEN

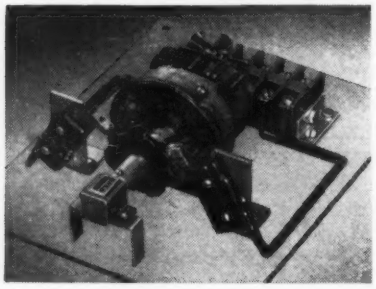
constituents. Sodium and other metallic salts can also be removed at this stage, if desired. The exchanger is regenerated with ordinary salt for the removal of calcium and magnesium; where total removal is necessary, acid is used as a regenerant.

In either case, a second step follows, in which the anion exchanger absorbs the acid resulting from the initial step, producing water "made-to-order."

Timing Contactor QC 608

A new timing contactor has just been announced by B/W Controller Corporation to be used in testing electrically operated mechanisms such as solenoids and relays, particularly where break-down or life tests are desired.

B/W timing contactor consists of a synchronous motor, available in various



speeds, and two micro switches operated by a cam disc fastened to the motor shaft. It can be operated continuously for an indefinite period of time without attention. By using discs with various numbers of cams, and motors of various speeds, the number of makes and breaks per minute is practically unlimited.

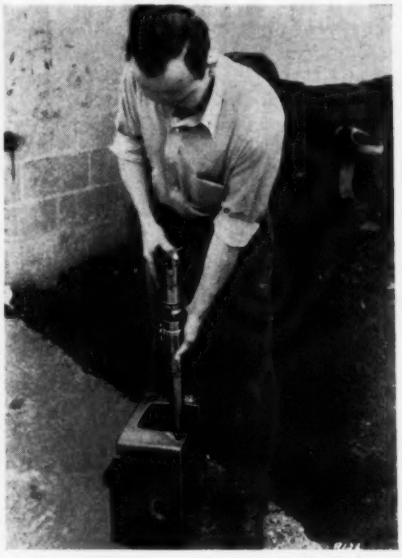
Although this unit is particularly valuable in running "destruction tests" to determine the life of the equipment being tested, it can also be used where contacts are to be opened and closed regularly.

Terminals are provided for easy wire connections, and two switches are standard equipment so that two tests can be run at the same time. The counter, for short runs, is optional. The unit is portable, has no tubes, and no intermediate contactors are necessary. All items are mounted on a steel back plate and come enclosed in a 9" x 12" x 4" sheet metal case finished in black wrinkle enamel.

Hardness Tester QC 609

A portable hardness testing hammer is announced by Steel City Testing Laboratory and it is identified as Type "P." While the usual method of testing for hardness is by means of costly testing devices, using especially prepared test pieces; in many instances it isn't necessary to obtain a scientifically accurate value, but is sufficient to know the hardness in regard to workability. With this self-acting hammer, it can be done quickly, employing unskilled labor and repeated tests can be made without readjusting the hammer. If material of a certain hardness is to be selected, it is only necessary to see whether the diameter of the impression made corresponds to that in a specimen with the desired degree of hardness. If the impression is larger or smaller, the specimen is either too hard or too soft.

The hammer consists of a cylindrical housing and a moving piston; the housing



is closed on one end with an inside thread cover, and on the other end with an open bushing. Between the cover and the piston, a strong spring is located which presses the piston against the bushing. The tension of the spring can be adjusted by turning the cover, if the hammer is to be set a certain power of stroke. The piston is coupled with a striking piston, which projects through the bore of the bushing guided by an airtight fitting ring in the cylinder and carrying a steel ball on the end.

Resting the hammer with the ball against the material to be tested and pressing on the operating end, the striking piston and the piston in the housing moves inward and presses against the spring between the piston and the cover. At a certain point, in this movement, the coupling between the piston and the striking bolt is released, so that the piston, under pressure of the spring, moves against the inner end of the striking bolt and the ball striking against the material to be tested. After the hammer is released, the striking bolt or piston is brought back to its former position by a spring in the cylinder.

Temperature Measurement QC 610

A new silica block for measurement of crown temperatures in glass tanks has been developed by Brown Instrument Company for use with Radiamatics, radiation pyrometers.

The new silica block is said to have three advantages, namely:

1. More constant calibration.

SILICO FLUORIDES

SODIUM

ZINC

MAGNESIUM

AMMONIUM

HENRY SUNDHEIMER COMPANY

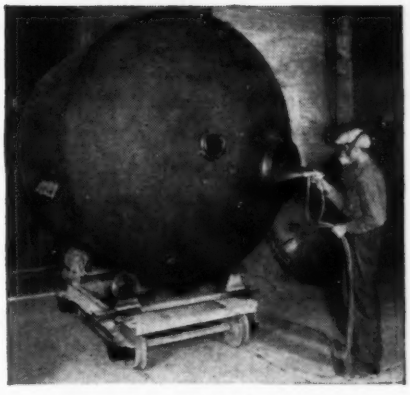
Established 1908

103 Park Ave. New York 17, N. Y.

THE INERTNESS OF GLASS THE STRENGTH OF STEEL

Shot Gun WEDDING

● First formed, welded and sand blasted,— and then lined with successive layers of our "Royal Blue" glass burned and fused integrally into the pores of the steel, in the white hot heat of our modern oil burning furnaces, Glascote equipment meets industry's most exacting acid resistant requirements. The glass, developed by our ceramic engineers specially for this service, is resistant to all acids at any concentration, at low or elevated temperatures, with the exception of hydrofluoric, phosphoric hot concentrated, and certain concentrated alkaline solutions with which there are certain limitations. Furnished open or closed, in sizes for pilot plant, semi-works or full plant operation. Let us quote on your reaction, distillation, mixing, storage or crystallizing requirements.



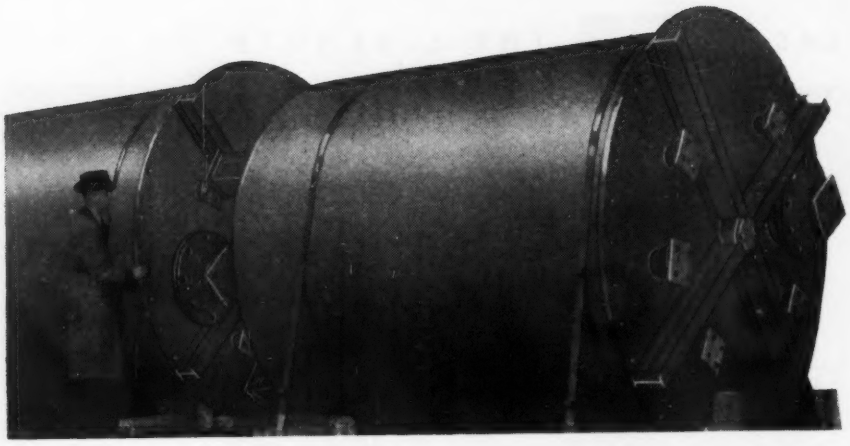
Spraying Inside of 1500 Gallon Tank Preparatory to Burning

GLASCOTE PRODUCTS, INC.

20910 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

ENGINEERING AND SALES REPRESENTATIVES IN THE PRINCIPAL CITIES

CORROSION RESISTANT EQUIPMENT FOR THE PROCESSING INDUSTRIES



3000 Gallon DDT Tanks of PYROFLEX Construction

EACH A COMPLETE FUNCTIONAL UNIT

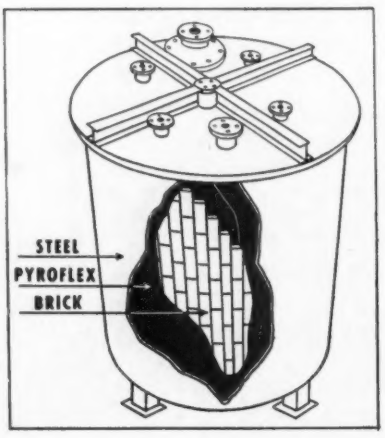
The above processing tanks to be used for making DDT* were designed by Knight engineers and built at our Akron plant. Each tank is a complete functional unit and is corrosion-proof because of its Pyroflex construction.

Many other types of processing equipment have been specially designed by Knight engineers. Usually they start out knowing only what the customer's problem is. They then design and build the needed Pyroflex unit and guarantee its successful performance.

Why not let Knight engineers design a tank specifically to meet your exact needs? In this way you will get the benefit of the Knight organization's 30 years' experience in the handling of corrosive materials. Full details about your problem will insure prompt attention.

MAURICE A. KNIGHT

[illegible] Kelly Ave., Akron 9, Ohio

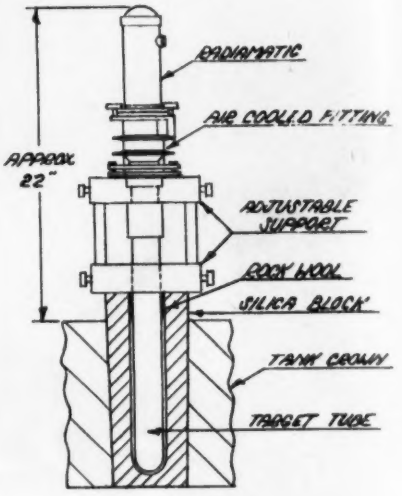


**War department's powerful insecticide*

Drawing of processing tank above showing Pyroflex acid-proof construction.

2. More open scale divisions throughout the operating range.
3. Lower net cost. Increased service life will more than offset additional initial costs.

The single hole silica block, according to the Brown division of Minneapolis-Honeywell Regulator Company, is installed flush with inside roof surfaces and



is sometimes installed so that the bottom of the block extends into the furnace for several inches. The Radiamatic is sighted into an 18-inch Sillimanite target tube which is installed in the block to within one-quarter inch of the bottom. An air-cooled fitting only is necessary to prevent overheating of the Radiamatic under normal operating conditions. The target tube is maintained under a slight positive pressure by a low pressure air supply.

The Sillimanite target tube is accurately positioned by adjustment of the vertical support. The annular opening between the Sillimanite tube and the silica block is packed with rock wool or similar material to prevent accumulation of batch dust.

Arc-Welding Electrode QC 611

A new heavily covered arc-welding electrode for welding low-alloy, high-tensile steels has been announced by the Electric Welding Division of the General Electric Company. Specially designed for use on carbon-molybdenum steel in the high-pressure piping industry, this electrode may also be applied to vessels and many other structural weldments.

The new electrode, Type W-56, operates satisfactorily on either alternating current, or direct current, reverse polarity, and its range of current is sufficiently broad to cover a wide range of plate thicknesses. A medium-long arc is recommended for best results with this electrode. It can be used in the flat, vertical, and overhead positions, producing a relatively flat deposit.

Features of the new electrode include a stable spray-type arc, deep penetration, and excellent creep-resisting qualities. In

ORONITE CHEMICALS

THE NAME TO WATCH IN CHEMICALS

LOOK BEYOND THE PRODUCT TO ITS MAKER

The delicate strength of a chemical bubble is the priceless quality that makes possible the efficient recovery of metals by the flotation process. These "bubbles" can be no better than the chemical employed nor can the chemical be better than the chemist who creates and produces it.

"Oronite"* is the name to watch in chemicals. Whether you need a wetting agent or sulfonate . . . whether you are recovering metals by flotation and need a reagent . . . or making a special product that requires something new, you can look to Oronite with confidence and for the backing of an able group of research chemists whose resources are second to none.

Your inquiry will not obligate you in any way.

ORONITE NAPHTHENIC ACIDS

Oronite Naphthenic Acids consist chemically of a five membered carbon ring to which a carboxyl group (acid) and one or more alkyl side chains are attached. They combine with alkali to form soaps and as such, or alone, are used as flotation reagents. Those who are using Naphthenic Acids and who contemplate their use after the war, will do well to consider Oronite as a supply source. Complete data is available *now*, as are the services of the Research Division of this company. A letter indicating your interest will receive prompt attention.

*REG. U. S. PAT. OFF.

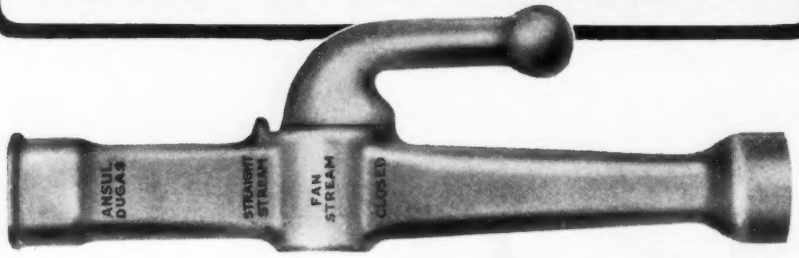
9004

ORONITE CHEMICAL COMPANY

Russ Building, San Francisco 4, California
White-Henry-Stewart Bldg., Seattle 1, Wash.

30 Rockefeller Plaza, New York 20, N. Y.
Standard Oil Bldg., Los Angeles 15, Calif.

NOW...NEW DUAL-STREAM NOZZLE
further steps up fire-killing punch of
DUGAS EXTINGUISHERS!



NEW DUAL-STREAM NOZZLE deals effectively with spill fires and fires difficult to reach because of height or obstructions. Designed for use with DUGAS wheeled extinguishers, the new Dual-Stream Nozzle greatly increases fire fighting range and effectiveness. A turn of the handle gives a *straight* stream with a range of 45 feet—or a *fan* stream with a range of 15 feet.

STRAIGHT STREAM of fire-killing DUGAS Dry Chemical permits a large fire to be knocked down from a safe distance before operator goes in to extinguish it.

FAN STREAM enables operator to concentrate heavy cloud of DUGAS Dry Chemical on fire and minimizes flash-backs.

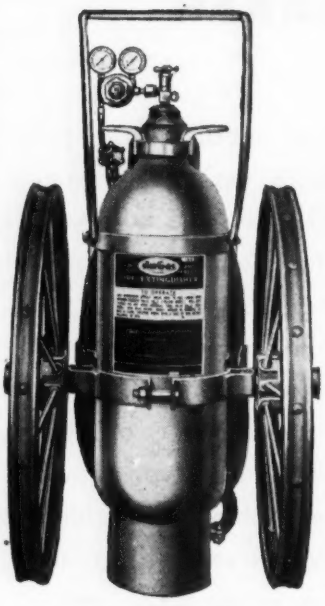
***Quick Facts about* DUGAS Dry Chemical**

- For extra-hazardous fires involving flammable gases, liquids, greases or electrical equipment.
- Not an electrical conductor.
- Non-toxic, non-corrosive, non-abrasive.
- Not affected by extreme cold or heat.

Write today for complete information regarding DUGAS Wheeled Extinguishers with the New Dual-Stream Nozzle . . . and DUGAS Hand Extinguishers.

AN ANSUL PRODUCT
duGas
THE MASTER OF FLAME

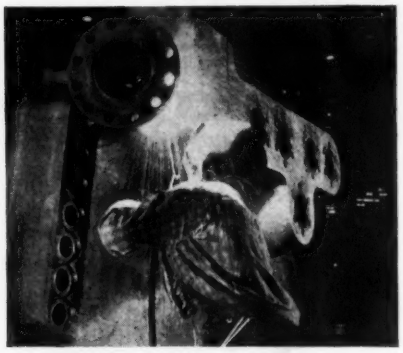
Approved by Underwriters' Laboratories, Factory Mutual Laboratories.



DUGAS 150-A WHEELED EXTINGUISHER

ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN
DUGAS DIVISION

addition, the covering used produces an easily removed, light, friable slag, which



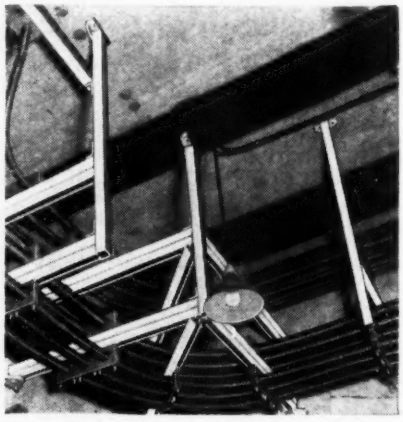
sets up fast, facilitating proper manipulation of the electrode. Available in sizes 1/8, 5/32, and 3/16 inch in diameter, the new electrode meets the requirements of AWS Classes E7010/E7011 and complies with Navy Bureau of Ships specifications 46E2.

Framing and Support System QC 612

Fabrication of any type metal frame, stock rack, support or hanger now can be quickly and easily completed right on the job by the new Unistrut method.

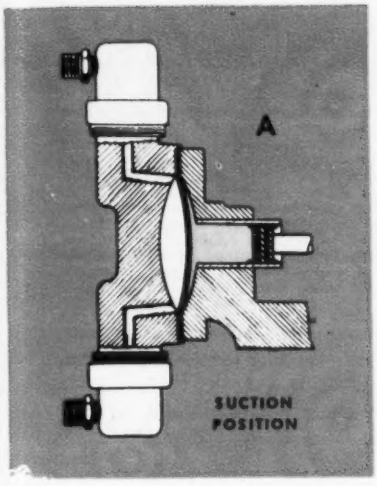
Unistrut consists of a slotted hollow-square steel or other metal section and standard spring-held nut attachments. Unistrut does not require drilling of holes, riveting or welding, and can be cut to any desired length with a hack saw.

The nut attachment slides along in the hollow square to any point or points where it is desired to attach it to (1) another Unistrut member, (2) a supporting structure, (3) or to the floor, ceiling or wall.

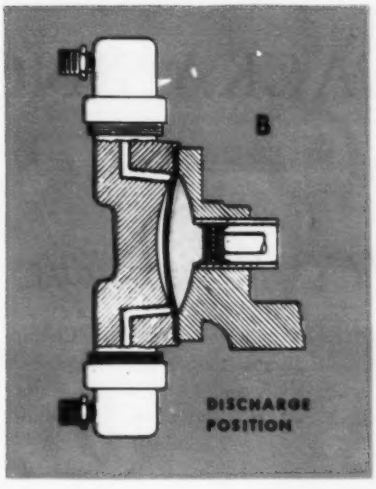


The Unistrut nut has serrated teeth which bite into the inturned edges of the hollow square section, and hold the attachment firmly in position when the nut is tightened with an ordinary wrench. However, the nut can be easily loosened, the attachment moved to a new location and again tightly fastened.

Because of its hollow square design, Unistrut has the necessary properties for use as a compression or tension member, strut, column, or beam. It is furnished in sections of several sizes or gauges, usually 16 ft. or 20 ft. long, but available in shorter lengths.



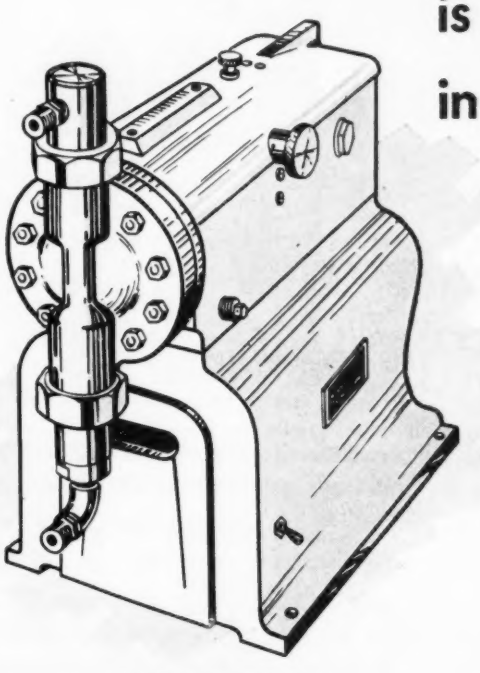
HYDRAULIC BALANCE in chemical proportioning pumps is exclusive with Wilson Pulsafeeders. The piston reciprocates a liquid medium interposed between the diaphragm and piston. This causes the diaphragm to react positively to every change in piston position. These diagrams are exaggerated to show piston-diaphragm action at minimum and maximum of the strokes. Actually the diaphragm-travel in small machines is barely perceptible. From a mechanical point of view diaphragm life is infinite.



Hydraulic Balance...

is the key to SUPERIORITY in WILSON PULSAFEEDERS

(CHEMICAL PROPORTIONING PUMPS)



WRITE FOR WILSON
BULLETIN D-1144

Wilson Pulsafeeders move liquids positively. Operating on the principle of positive displacement, the Pulsafeeder embodies features which make it the most accurate liquid handling device known. Accuracies up to ⅛ of 1% are obtainable where required.

But accuracy without persistence would be of little value. It is their extraordinary persistence with accuracy that has won for Wilson Pulsafeeders the approval of laboratory, industrial, municipal and national government technicians all over the world.

Today, more Wilson Pulsafeeders are operating in remote placements where need for frequent servicing cannot be tolerated, as well as in near-by areas, than at any time in their 22-year history.

If you have a chemical proportioning requirement of any nature for laboratory, food processing, water purification, sewage disposal or industrial practice, send for our new folder of general information or, better still, detail your requirements so that we may give you specific information. Available in both high and low pressures, models up to 20,000 pounds per square inch . . . and for volumes from a few c.c.p.h. to 1000 g.p.h. Models also available for the compression of gases.

We also manufacture liquid filling machines and dry chemical feeders.

WILSON PULSAFEEDERS are known by the companies they keep in precision production

WILSON CHEMICAL FEEDERS, INC.

Established 1923 • With Experience in Allied Lines Since 1914

215 CLINTON STREET BUFFALO 4, N. Y.

PACKAGING & SHIPPING

by T. PAT CALLAHAN

ICC Regulations Amended

THE Interstate Commerce Commission regulations were amended on June 29, 1945, and we quote below these amendments as they affect the chemical industry.

T. Pat Callahan

Section 110(b) (8) was amended by cancelling specification ICC 21B fiber drums. The reason for this cancellation was given as follows: "I.C.C. Specification 21B fiber drum, 5-gallon capacity was authorized during the emergency due to an acute shortage of metal. However, the drum has not been found commercially practicable both from manufacturing and shippers' standpoint. All shippers and all manufacturers known to be interested were circularized under date of December 26, 1944, wherein they are advised that it was intended to cancel the authority. One manufacturer did not answer and one other stated that the very rigid specifications set up could not be met by them. All others took no objection to the cancellation."

To this section 110 was made another amendment, Par. (d) (5) which is as follows:

"(d) (5) Viscous inflammable liquids having a vapor pressure which does not exceed 16 pounds per square inch, absolute, at 100°F. (See sec. 110(c) for higher pressure liquids) must be prepared for shipment in containers as follows:"

This amendment added the statement "having a vapor pressure" to the requirement for shipment in containers.

Section (d) (9), (d) (10) and (d) (11) were added to the regulations as follows:

"(d) (9) Viscous inflammable liquids with flash point above 20°F. to 80°F. and having a vapor pressure which does not exceed 18 pounds per square inch, absolute, at 100°F. must be prepared for shipment in containers as follows:
"(d) (10) As prescribed in sec. 110(c).
"(d) (11) Spec. 17e.—Metal drums (single-trip)."

The purpose of this change in the section was to clarify present packing of viscous inflammable liquids and to provide an additional container.

Section 113(g) was cancelled so that dichlordiphenyl trichlorethane (DDT) was taken out of the regulations. This product can now be shipped without conformance with Class B poison restrictions.

Section 154 was amended by the addition of titanium metal powder, wet, to provide for transportation of a material which is properly an inflammable solid.

Section 182(b) was amended as follows:

"(b) In bags in tight cars or motor vehicles. Motor vehicles should be of closed type, or lading consisting of bags should be covered.
Reason: In order to prevent the ignition of bags containing ammonium nitrate in transportation the amendment proposed has been brought to the attention of the Manufacturing Chemists' Association and the members of that association and interested shippers agree that such a requirement should be included in the regulations for safety."

Section 211(A) was added as follows:

"Sec. 211A (a) Titanium metal powder, wet, with not less than 20% water, must be packed in specification containers as follows:
(b) Spec. 15A or 15B.—Wooden boxes with inside metal can of not less than 22 gauge, not to exceed 10 gallons capacity, tightly and securely closed. Not more than one such inside container may be packed in one outside container."

Section 245 was amended by the addition to sec. 245 (r) and (s) of (r), difluorophosphoric acid, anhydrous and (s), monofluorophosphoric acid, anhydrous. The reason was to correct an omission.

Section 263(a) was amended as follows:

"Add (a) (6) (b) Spec. 1D.—Boxed glass carboys of not over 6.5 gallons nominal capacity. Means shall be provided so that accumulated total pressure in bottle shall not exceed 10 p.s.i. gage at 130° F. or shall vent at a pressure not to exceed 10 p.s.i. gage."

Specification 1D is a new specification for a boxed glass carboy.

Section 268(d) was amended as follows under (d) (2) by the addition of this new specification, 1D:

"(d) (2) Spec. 1D.—Boxed glass carboys of not over 6.5 gallons nominal capacity; authorized only for acid not over 1.43 specific gravity (43.61° Baume). Means shall be provided so that accumulated pressure in bottle shall not exceed 10 p.s.i. gage at 130° F. or shall vent at a pressure not to exceed 10 p.s.i. gage. Cushioning must be incombustible mineral material, elastic wood-strip packing, or large elastic cushions such as cork, fastened securely in position. The use of hay, excelsior, ground cork, or similar material, whether treated or untreated, is prohibited.
"(d) (2) Spec. 1D.—Boxed glass carboys of not over 6.5 gallons nominal capacity; authorized only for acid of not over 100.5 per cent H_2SO_4."

Section 332(a)(3) was amended by changing present sec. 332(a)(3) and adding new par. (a)(3) to read as follows:

"(a) (3) Spec. 3A480.—Metal cylinders of not over 125 pounds water capacity (nominal), minimum wall thickness 0.147", and in no case shall the wall stress exceed 24,000 pounds per square inch when calculated by the formula in par. 9(b) of Spec. 3A; valve protection cap must be used and be at least 3/16" thick, gastight, with 3/16" faced seat for gasket and with United States standard form thread; the cap must be capable of preventing injury or distortion of the valve when it is subjected to an impact caused by allowing cylinder, prepared as for shipment, to fall from an upright position with side of cap striking a solid steel object projecting not more than 6" above floor level."

The reason for this change is to provide an additional container for the shipment of liquid hydrocyanic acid.

Section 358(a) was amended by the addition of the following:

"Sec. 358 (a) Dinitrobenzol must be packed in specification containers as follows.
"(b) As prescribed in sec. 361.
"(c) Spec. 11A.—Wooden barrels, gross weight 300 pounds; must be shipped in carload or truckload shipments only and must not be offered for transportation by carriers by rail express or water."

Section 402 (p) was amended as follows:

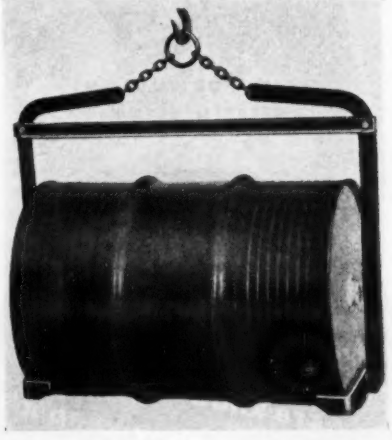
"Labels and marking name of contents are not required on shipments of dangerous articles forwarded in carload or truckload quantities by rail freight, rail express or highway, when such shipments are unloaded by the consignee or his duly authorized agent from the car or truck in which originally loaded. This exception does not apply to class A or class C poisons."

This amendment was for purposes of clarification.

Toggle Type Barrel Cradle

What is said to be an improved style of barrel cradle has been announced by the manufacturer, Palmer-Shile Co., 7131 West Jefferson Avenue, Detroit 17, Michigan.

The company's president, E. R. Shile, claims that this barrel cradle is unusually



versatile, being able to pick up any shaped barrel or drum, with straight or bilged sides, and with flat or chimed ends. While primarily designed for handling barrels and drums, it can efficiently serve to pick up rolls of paper, carpeting or other cylindrical packages. It has a capacity of

324 DIFFERENT PRODUCTS NOW PROVE THE ECONOMY OF MULTIWALL PAPER BAGS

324 different products – foods, chemicals, fertilizers, cement and other building materials – are now being packaged and shipped in St. Regis Multiwall Paper Bags.

These sturdy containers are daily proving their efficiency and economy under the rigorous conditions of wartime shipping. Husky, moisture-resistant Multiwalls protect products from dampness, salt spray, and even rain. And, Multiwalls reduce siftage losses as well as losses caused by infestation and contamination.

In addition, Multiwall Paper Bags are easy to handle . . . save manpower and valuable loading and unloading time.

Faster packaging, too – Specially designed St. Regis bag-filling machines bring high speed and a saving of labor and equipment to the users of Multiwall Bags.

By the Valve-pack System, for example, your product is accurately pre-weighed and automatically propelled into self-closing bags.

A complete bag-packaging service – St. Regis manufactures all types of Multiwall paper bags and bag-filling machines. Our packaging engineers are now available to study your packaging problems and to recommend the complete units which will be best suited to your individual needs.

If you are considering a better all-around package for your post-war production, call your nearest St. Regis representative TODAY.

MULTIWALL

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TASSART CORPORATION

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 2601 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

IN CANADA:
St. Regis Paper Co. (Can.) Ltd.
Montreal, Quebec
Vancouver, British Columbia

Boston, Mass. Franklin, Va. Dallas, Texas Denver, Colo. Toledo, Ohio Los Angeles, Calif.
New Orleans, La. Birmingham, Ala. Seattle, Wash. Nazareth, Pa. No. Kansas City, Mo.

1,000 lbs., and is made of heavy bar stock, welded construction.

While the one illustrated handles units 20″ to 25″ diameter and 32″ to 36″ in length, special sizes can be obtained. Additional details on standard and special models will be supplied by the manufacturer.

Fibreboard Boxes

The Interstate Commerce Commission regulations specify fiberboard boxes under the designation of ICC 12B, 12C, 12D, 12E and 12L. While we have been attempting to cover all specification packages in our series, we will not quote the very extensive specifications for these containers except to state that fibreboard boxes of above specifications are permitted as inside and outside containers for various products. However, their big use is as inside containers for smaller packages.

We quote one section on inside packaging from specification ICC 12B, which is the master specification for all others with the exception of ICC 12L, which is a hexagonal fibreboard container.

"*Liquids or solids in glass or earthenware:* Must be packed with linings, partitions, wrappers, excelsior, straw, or other material, sufficient to afford adequate protection against breakage or damage. *Unauthorized packages are:* Those over 65 pounds gross weight; those with any inside container over 1-gallon capacity; those with more than 4 inside containers exceeding 5-pints capacity each.

Liquids in metal cans: Must be packed as necessary to afford adequate protection against breakage or damage. *Unauthorized packages are:* Those with any inside container over 1-gallon capacity.

Solids in inside containers other than glass or earthenware: Must be packed as necessary to afford adequate protection against breakage or damage.

Mixed shipments (inside containers of different sizes, or solids and liquids in same outside container): Must be packed as prescribed for articles in glass or earthenware (par. 3)."

We suggest that anyone desiring to avail themselves of the use of fibreboard boxes for dangerous material consult the regulations for the movement of the specific product and the specification governing the construction of fiberboard boxes. Practically all manufacturers of fibreboard boxes are familiar with the strict requirements in the manufacture of these containers and can be of assistance to anyone desiring their use.

Aluminum Containers

Continuing our discussion of I. C. C. specification containers, we shall deal with the ICC 42 series, which covers containers manufactured from aluminum. These containers are referred to as "specialty containers" within the chemical industry and are used not only for materials covered by the Interstate Commerce Commission, but also for a great number of products which are not classified as dangerous. The specifications include the ICC 42B, ICC 42C and ICC 42D.

The material which may be used in the construction of any of these containers is specified as follows:

Body and heads of aluminum at least 99% pure, or an aluminum base alloy of equivalent corrosion resistance and physical properties.

All seams must be welded including attachment of flanges for closures and other devices. Circumferential seams at least 3″ from top of chime; chime seams are not permitted. As usually found in other specifications, the parts and dimensions for the different specifications differ, and in the case of aluminum drums, the parts and dimensions of the ICC 42B are more rigid than the ICC 42C and the parts and dimensions of 42C are more rigid than the ICC 42D.

We do not believe it necessary to go into the various differences in thicknesses of metal which are used in the various constructions of the ICC 42B, ICC 42C and ICC 42D drums because these are of necessity topics of discussion for the manufacturer and anyone desiring to purchase aluminum drums.

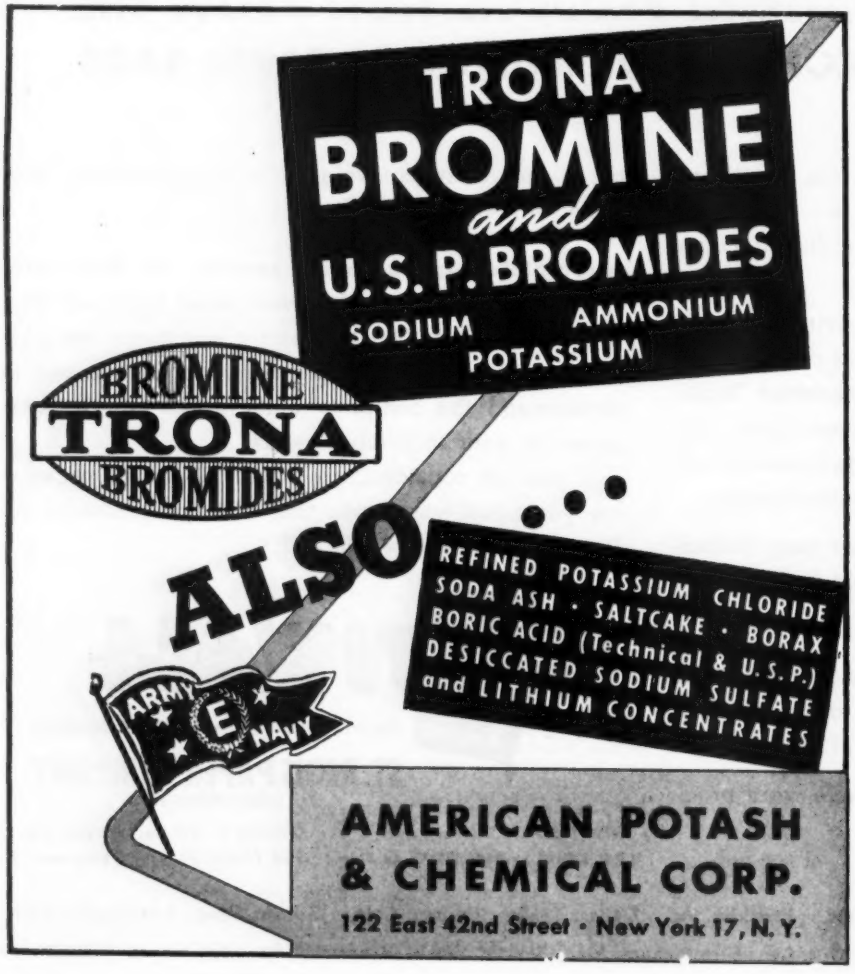
Various special chemicals are packed in aluminum, and, as stated, a great many products packed do not come under the Interstate Commerce Commission Regulations. However, it is well when purchasing aluminum drums to have them built to I. C. C. specifications as these are expensive containers. Subsequently it may be necessary to use them for products governed by the I. C. C., and if they are not built to I. C. C. Specifications, they cannot be used.

New Carboy to Withstand Pressures

As discussed under the recent amendments to the Interstate Commerce Commission regulations, the adoption of a new carboy, Specification ICC 1D, brings to the chemical industry the first glass carboy constructed and designed to withstand pressures of regulatory acids. We shall quote the specifications in full next month.

At the present time, the Commission only permits this carboy, so far as regulatory products are concerned, for the shipment of sulfuric, hydrochloric and nitric acids of the same strengths now permitted in the ICC 1A carboy.

Further work is contemplated by the chemical industry in order to develop uses beyond these three acids for this



"Run, Maw, I'm only loaded fer squirrel!"

There are times, though, when singleness of purpose has its points. Take us. Crown does just one thing—makes cans. We have no other interests. All our forces—mental, financial and mechanical—are devoted to the production of high quality cans. That's why they *are* good. The same goes for Crown service. It's personalized, it's efficient, and it's complete . . . In this concentration of effort lie distinct and profitable advantages to every can user. That means you.

CROWN CAN

INDEPENDENT AND HELPFUL

CROWN CAN COMPANY • NEW YORK • PHILADELPHIA • Division of Crown Cork and Seal Company, Baltimore, Maryland

DOW
chemicals available for prompt delivery

Dipropylene Glycol, Technical

Dipropylene Glycol is an outstanding high-boiling solvent for many organic materials. It is completely miscible with water and with a long list of other substances, including the following:

Tall oil (ligro)	Pine oil	Ethyl ether
Perchlorethylene	Diethanolamine	Dichlorethyl ether
Monochlorbenzene	o-Dichlorbenzene	Benzene
Dibutyl phthalate	Castor oil	Toluene
Monoethanolamine	Carbon tetrachloride	Dextrin (10% in H_2O)

It also dissolves, to a varying degree, such diverse materials as coconut oil, linseed oil, VMP naphtha, urea, kauri gum, and rosin.

Dow can make immediate shipment of Dipropylene Glycol, Technical, in 55-gallon drums or tank car lots. Your inquiries will be given prompt attention.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

ISCO

- CAUSTIC POTASH . . . LIQUID, FLAKE, SOLID, BROKEN, GRANULAR, WALNUT
- CAUSTIC SODA . . . LIQUID, FLAKE, SOLID
- CARBONATE OF POTASH . . . HYDRATED, CALCINED, LIQUID
- FERRIC CHLORIDE . . . LUMP AND CRYSTAL
- CHLORIDE OF LIME (Bleaching Powder) . . .
- SODIUM SILICO FLUORIDE — 98-100% . . .

UNIFORM QUALITY, PRIME WHITE, FREE FLOWING . . .
In Barrels: 375 lbs. Net

INNIS, SPEIDEN & COMPANY • 117 Liberty Street • NEW YORK 6
BOSTON • CHICAGO • CINCINNATI • CLEVELAND • GLOVERSVILLE • PHILADELPHIA

carboy which will be presented to the Commission for their approval.

Nailing Boxes For Export

An important phase of the wooden box which may be sometimes overlooked is the fact that the nails used in the assembly of the box are incorrect in size or are not properly treated. One of the best definitions of an export package which has come to our attention is as follows:

"A package which is correct for overseas shipment of war material is one to which has been applied principles of common sense; one which, in all possible cases exceeds rather than shades the requirements of the specifications involved; one in which equal attention has been given to exterior and interior containers, blocking and bracing, corrosion prevention, and permanent marking; one in which a shipper takes pride in his assurance that despite rough handling, outdoor storage at the ends of the earth and transportation of all types, his product will be *ready for war*."

The most commonly used treated nail is known as the cement coated nail, but these are not always available. Tests at the Forest Products Laboratory have proven that ordinary box nails treated according to the following formula have greater holding power and may be used wherever cement coated nails are applicable.

Following is the nail coating solution which has been recommended, and it is reported that nails treated with this solution give greater holding power than cement coated nails:

"10% solution (by weight) of monoammonium phosphate.

"One (1) part phosphate to ten (10) parts of water.

"Put solution in non-ferrous container; stir occasionally. Put in nails; leave in solution seven (7) hours. Remove and rinse in cold water. Air dry.

"Five (5) gallons treat one hundred (100) pounds of nails.

"This solution gives greater holding power than cement coated nails."

Textile Bag Restrictions Changed

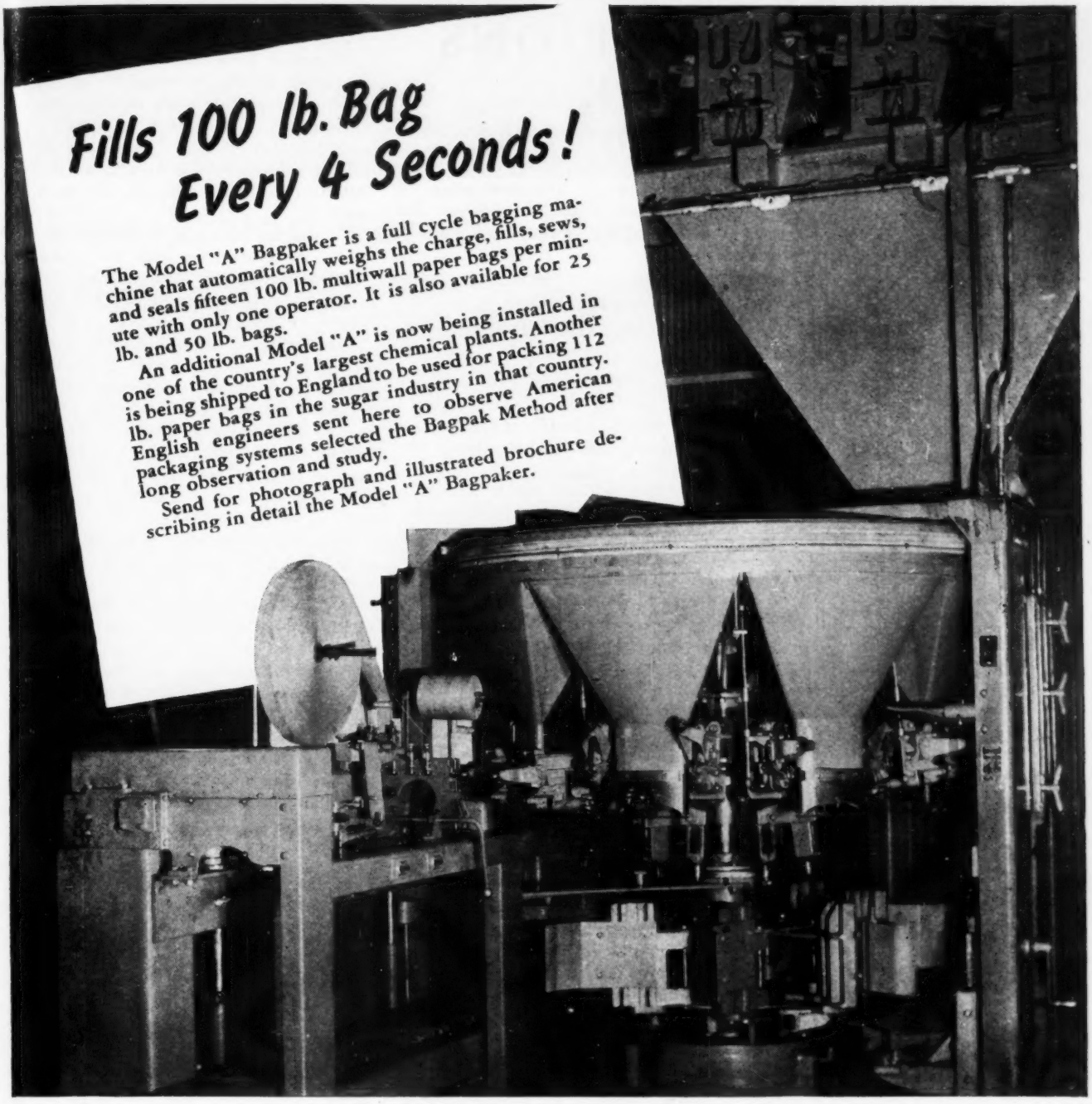
Conservation Order M-221 was amended July 10, 1945: "(n) Products permitted for new burlap bags. No person shall use any new textile bag made of burlap for packing fish meal, fish scrap, tankage, meat scraps for any purpose other than the packing of the following permitted products; agricultural products; abrasives; crushed oyster shells; fertilizer; meat; mohair; petroleum waxes; stearic acid; wool or wool products; or chemicals for export. These restrictions do not apply to surplus new military sand bags which may be used to pack any product."

Fills 100 lb. Bag Every 4 Seconds!

The Model "A" Bagpaker is a full cycle bagging machine that automatically weighs the charge, fills, sews, and seals fifteen 100 lb. multiwall paper bags per minute with only one operator. It is also available for 25 lb. and 50 lb. bags.

An additional Model "A" is now being installed in one of the country's largest chemical plants. Another is being shipped to England to be used for packing 112 lb. paper bags in the sugar industry in that country. English engineers sent here to observe American packaging systems selected the Bagpak Method after long observation and study.

Send for photograph and illustrated brochure describing in detail the Model "A" Bagpaker.



INTERNATIONAL PAPER PRODUCTS DIVISION

International Paper Company

220 EAST 42ND ST., NEW YORK 17, N. Y.

BRANCH OFFICES: CHICAGO • CLEVELAND • BALTIMORE • PHILADELPHIA • ATLANTA • ST. LOUIS • PITTSBURGH

Agents for

Bagpak, Incorporated

George & Sherrard Paper Company

ALL-WEATHER KRAFT BAGPAK

* *Trade Mark reg. U. S. Pat. Off.*

KRAFT GATOR HIDE GATOR HIDE

George & Sherrard Paper Co.

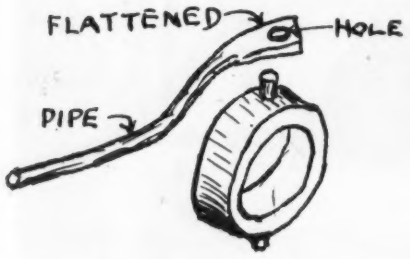
ONE-MAN PACKAGE EASY TO HANDLE

PLANT OPERATIONS NOTEBOOK

Spanner Wrench From Ordinary Pipe

If the regular spanner wrench is lost, as sometime happens, and one is needed in a hurry, a suitable wrench can be made from ordinary iron pipe as indicated in the accompanying sketch.

Flatten one end of the pipe, as shown,



drill a hole of correct bore through the flat end and bend the "handle" to proper fitting shape. Cutting the pipe to the desired length produces a usable wrench.

Gasket Practice

Although asbestos has been used for many years as a gasket material, sheet asbestos is still useful for many gasketing services. During the rubber scarcity period asbestos was found useful where it was thought that only rubber gaskets could serve.

Rubber covered canvas gaskets are usually satisfactory in water and steam pipe joints up to 50 lb. pressure. Between 50 lb. and 160 lb. rubber covered wire gaskets 1/16 of an inch thick are often used. Corrugated steel gaskets give good service for superheated steam where pressures exceed 160 lb. Corrugated steel gaskets are not considered necessary in water lines of either low or high pressure.

By machining the flange faces in such a manner as to support or retain the gasket, blow-out dangers are minimized, greater unit pressure is exerted upon the gasket, and possibility of leakage is lessened. The objection to these flange faces, however, such as the male and female, and tongue and groove joints, is that they cost more, are more difficult to install, and are not easily taken apart. Retained gaskets are commonly used in high pressure liquid or gas lines.

In general, the thicker the gasket the more securely it can be clamped in the joint and the less the danger of leakage. This is particularly true if the gasket is elastic.

Ring gaskets are employed in the Van Stone joint and are highly satisfactory. They are comparatively small in area, consequently a high unit pressure is exerted upon them. The disadvantage of the full-faced gasket is the lower unit pressure and the consequent possibility of leakage.

Protecting the Skin From Organic Solvents

Unless precautions are taken, troublesome skin injuries may result from the constant handling of most of the commonly used organic solvents, including gasoline, naphtha, benzene, turpentine, trichlorethylene, and carbon tetrachloride.

According to the Safety Research Institute, these injuries, as a rule, consist of a local reddening of the skin, followed by wheals, blisters, and, later, chronic sores. When such conditions develop, they must be treated by a physician; but with proper care they may be prevented.

It is best, whenever possible, to so arrange work that workers do not come into direct contact with solvents; if this cannot be done, gloves, sleeves, and other protective clothing may be provided. This clothing must be made of a material that is not attacked by the solvent in use, and it is therefore important to consider which solvents are in use when purchasing protective clothing.

The use of gloves may be objectionable, either because they are inconvenient or because they themselves irritate the skin. In the latter case, the most satisfactory procedure is to cover the hands with a protective cream before using gloves. Several proprietary protective creams are available, each adapted for use with certain types of solvents.

After work the hands should be cleaned with a mild soap containing, if necessary, a synthetic detergent and an abrasive that softens in water, such as corn meal. Strongly alkaline soaps, sharp abrasives, and solvents should never be used. After washing, it is well to apply an ointment consisting of 50% cold cream and 50% lanolin.

The foregoing applies to normal workers, but exceptional cases may be found. Some persons seem immune to the action of certain solvents, while others may be so sensitive to a specific solvent that the slightest contact with it will cause widespread inflammation of the skin. It is also possible for workers who were originally normal or immune to become sensitive during the course of their work. Any apparent sensitivity of a worker towards a given solvent should be verified by a patch test, and persons abnormally sensitive to solvents should be given work that does not require their use.

Volume Contained in a Cylindrical Tank

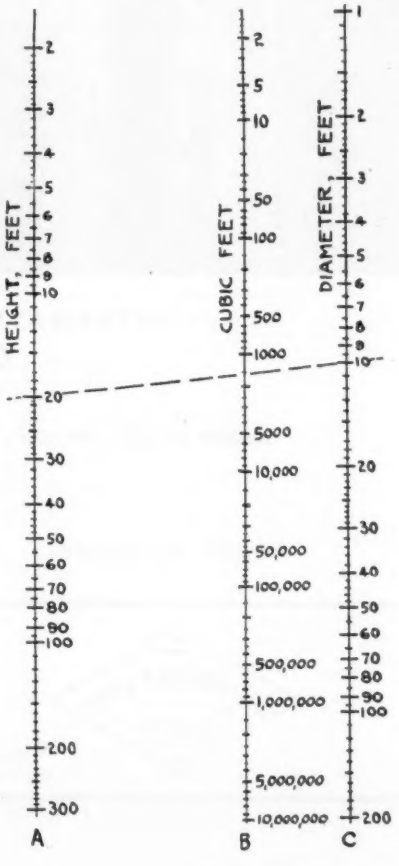
The chart below will be found useful and quick for the determination of the number of cubic feet in any vertical cylindrical tank from 1 to 200 ft. in diameter, and from 2 to 300 ft. in height. The indicated capacities vary from 2 to 10,000,000 cubic feet, sufficient for most cases.

To use the short run a straight line across the chart connecting the height of the tank with its diameter and the intersection with column B will give the number of cubic feet.

For example, if the tank is 20 ft. high and 10 ft. in diameter, what is its capacity? The dotted line drawn across the chart shows how this is done. Connect the 20 ft., column A, with the 10 ft., column C, and the intersection with column B gives the answer as a little less than 1600 cu. ft. Upon calculation this value is found to be 1570 cu. ft.

In case it is desired to know the contents of a given tank at a given level, column A represents the depth of the content in feet and column C the diameter, as before. The figures in column B then represent the cubic feet in the tank.

The chart may also be used backwards for determining the height to which a tank should be built, or the diameter it should be given to hold any number of cubic feet. Or, it may be used for determining the height to which a tank should be built where the capacity and diameter are both known.



Chlorinated • Paraffin • Resinous

Chlorowax

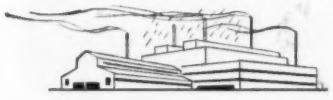
★ Resinous in Nature

★ Flame Resistant

★ Moisture Resistant

★ Compatible with Resins and Plastics

Just a few of the possible Post-War applications for Chlorowax



Industrial and Maintenance Paints

For all industrial purposes, interior and exterior; maintenance paints for residences and office buildings.

Lacquer Formulations

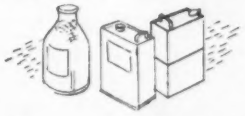
Chlorowax improves adhesion to metal, glass and wood. Increases chemical resistance of protective coatings.

Surface Treatments and Polishes

Chlorowax content in surface coatings improves water and flame resistance; aids in preserving polished finishes.

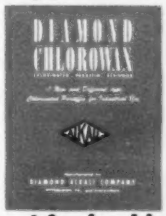
Textile Coatings

Flame and moisture resistant for awnings, canvas, drapes, gloves, machine covers, tents, tarpaulins, etc.



Glues and Adhesives

Invaluable in formulation of waterproof and flame resistant glues and adhesives.



Send for booklet

Gives information on properties and uses.

DIAMOND CHLOROWAX

DIAMOND ALKALI COMPANY

Pittsburgh 22, Pa.

LABORATORY NOTEBOOK

Glass Stirrer Makes Mercury Seal Unnecessary

A glass stirrer of Fish-Schurman Corporation is made so accurately that a pressure difference as great as 60 mm. of mercury between the inside and outside of the flask causes no leakage of gas around the stirrer shaft, according to the manufacturers. It is claimed that not only is leakage avoided but no impurities can be introduced into the flask because the stirrer is all glass.

In stirring the contents of flasks maintained under low pressure or vacuum, it no longer is necessary to provide a mercury seal to close the stirrer shaft against leakage, if the new F-S stirrer is employed, it is said. Pressures ordinarily required in glass apparatus are held easily by the smooth rotation of the glass shaft in the precisely fitted glass tube. If the pressure difference reaches 60 mm. of mercury or more the stirrer or shaft may be lifted up in the bearing but even then no leakage of gas is observed, it is claimed.

Escape Hatch for Laboratories

Every possible precaution against accident is taken at The Firestone Tire and Rubber Company's new research laboratory, and to guard against events beyond the control of the scientists every available safety device has been installed in the laboratory. In case fire or accident should block the doorway the workers can go from one laboratory to another through escape hatches such as the one shown in this picture.

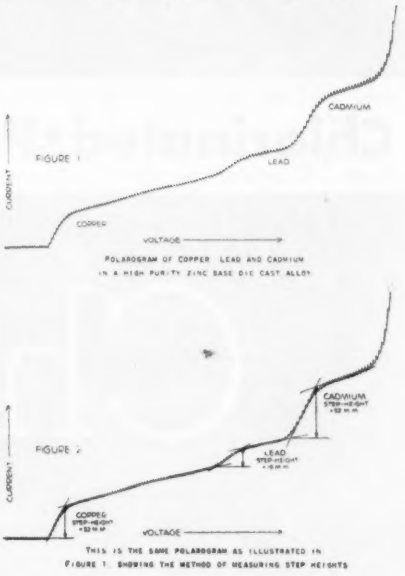
Recording Polarograph

A new model XX Sargent Polarograph, announced by the E. H. Sargent Co., facilitates analysis of simple or complex mixtures for metallic or organic constituents.

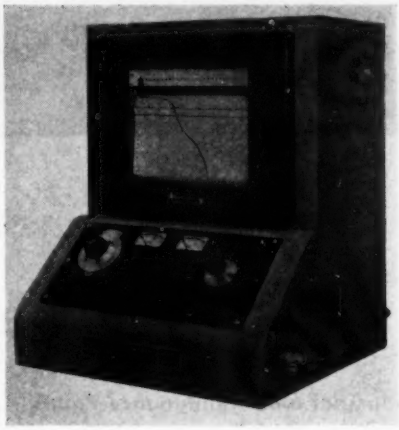
Taking advantage of recording developments for military use, the new model offers continuous recording of current and voltage. A number of advantages for the new instrument are cited by the manufacturer: elimination of the galvanometric element prevents loss of sensitivity due to extraneous vibration; photographic development of polarograms is obviated; chart recording makes the polarograms instantly and continuously visible, enabling prompt readjustment and providing a continuous rather than an intermittent reading of the data; large chart size provides greater precision in reading of step heights; and several other refinements give a more rapid and accurate analysis than was heretofore possible.

Polarography has proved to be such a versatile and precise analytical method that it has become extremely useful in such diverse fields as petroleum, ferrous and non-ferrous metallurgy, rubber, food, beverages, heavy chemicals, dyestuffs, drugs and pharmaceuticals, explosives, paints and varnishes, organic chemicals, and plastics.

The accompanying diagram shows a typical polarogram of a high purity zinc base die cast alloy containing traces of copper, lead and cadmium, and the method of determining the step heights. The analysis is performed by weighing out a sample, dissolving it in acid, diluting the solution to the proper concentration, and subjecting it to polarographic analysis. Weighing the sample is the only technique required, and forty samples can easily be run in a day.



Aside from the use of this instrument to analyze quantitatively for reducible ions, it also finds use in the study of reactions as a function of time. Diffusion currents, which are a function of time, can be recorded to study reaction kinetics, respiration rates, rates of corrosion, polymerization, tautomerism, and the like.



An extensive bibliography of papers dealing with the polarographic technique is available from E. H. Sargent & Co., 155-165 E. Superior St., Chicago 11, Ill., on request.

"Unfreezing" Glass Stoppers

A number of devices are manufactured for loosening ground glass parts, and for the most part they work very satisfactorily. A simple method, however, is to immerse the frozen parts in warm water to which a small amount of a synthetic wetting agent has been added. The reduction of surface tension enables the water to penetrate between the frozen surfaces as untreated water will not do.

ADVERTISEMENT—*This entire page is a paid advertisement.* *Prepared Monthly by U. S. Industrial Chemicals, Inc.*

U.S.I. CHEMICAL NEWS

August ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1945

Two Multi-Purpose Non-Phthalic Resins of Proven Practicality

Aroplaz 1125 & 1127 Are Fine Enamel Liquids for Brush, Spray or Dip Use

These two oxidizing, modified alkyd resins, S&W Aroplaz 1125 and S&W Aroplaz 1127, are highly successful alternates for phthalic alkyds in the preparation of coatings. Both resins have excellent initial color and color retention, making them suitable for whites and light tints. Initial gloss and gloss retention are excellent in both. Exterior durability is good, making them useful in exterior coatings where exposure is not severe, as well as for a wide range of interior applications. Use of reactive pigments with these resins should be avoided.

Probable Availability

Phthalic-free, these resins are more available than phthalic alkyds, although uses are still limited to some extent (allocation Order M-300, Schedule 103). They will probably be available for uses such as industrial equipment, tools, machinery, interior marine finishes, new farm implements, food-container exteriors and transportation equipment.

S&W Aroplaz 1125 is supplied in mineral spirits, and is adapted to a wide range of applications. It has good overnight drying properties, and light-colored bake finishes are obtainable in one hour at 200 F.

S&W Aroplaz 1127 is supplied in VM&P Naptha, a faster-evaporating solvent. The resin is faster drying than "1125". It air-dries hard in 8-10 hours, and bakes in one-half hour at 200 F.

Samples of both resins, and additional data are available on request.

SPECIFICATIONS

	S&W Aroplaz 1125	S&W Aroplaz 1127
Solids	50% in MS	50% in VM&P Naphtha
Solution Viscosity (G-H)	R-T	Q-R
" Color (G-H)	9-11	9-11
" Wt/gallon @ 25C	7.5 lbs.	7.4 lbs.
Plastic Acid No.	22-28	22-30

Lactyllactic Esters Made By New, Faster Process

Lactyllactic esters, valuable as solvents and plasticizers, may be produced on a commercial scale by use of an invention dedicated to the free use of the people of the United States. The esters produced by this process are said to be colorless, odorless, and of high molecular weight and low vapor pressure.

Essentially the new process comprises heating a dehydrated lactide with anhydrous mono- or poly-hydric alcohols in the presence of an acid catalyst. When the alcohol used is anhydrous ethanol, the end product is ethyl lactate, a colorless, odorless, slightly viscous liquid. From n-butanol, n-butyl-lactyllactate is produced, while ethylene glycol produces water-soluble beta-hydrozyethyl lactyllactate.

Ethanol-Water Fractionating of Proteins Points Way to Improved Immune Serums

Higher production of Pyrogen — Free Sera Forecast

Tetanus antitoxin to be produced by a new method will not cause the chills so often accompanying use of this antitoxin, nor will pyrogen-induced fevers follow use of any serum properly produced by the new process.

Separation of various protein fractions of blood plasma by ethanol-water fractionating, at low temperatures, was first used on a large-scale basis in production of serum albumin. However, this use of ethanol-water fractionating will probably be overshadowed by its use in making improved immune serums.

While finished serums and antitoxins produced by the usual salting-out-and-in process are free from bacterial contamination, few of them are free from pyrogens. It is virtually impossible to prevent entry of air-borne bacteria into the blood plasma during separation of the protein fraction which contains the anti-bodies. Growth of these bacteria results in fever-inducing pyrogens. With ethanol-water fractionating, the protein separation takes place at a temperature so low that pyrogens cannot develop, for the bacteria cannot grow.

At Lederle Laboratories, production of serum albumin led to interest in further possibilities of the ethanol-water process. They expect that the current loss of sera during processing will be materially reduced by ethanol-water fractionating. Purer products, too, are anticipated, as the new fractionating process is more exact, and is less dependent upon the operator's judgment.

Principle of the New Process

Certain details of ethanol-water fractionating at reduced temperatures are still under the protective cloak of secrecy. However, it depends upon physical-chemical principles far more complex than ethanol-precipitation. In practice, it is found that the five main blood proteins — alpha, beta and gamma globulin, fibrinogen and serum albumin—each separate

(*Continued on next page*)

U.S.I. Offers Aid in Insectifuge Formulation

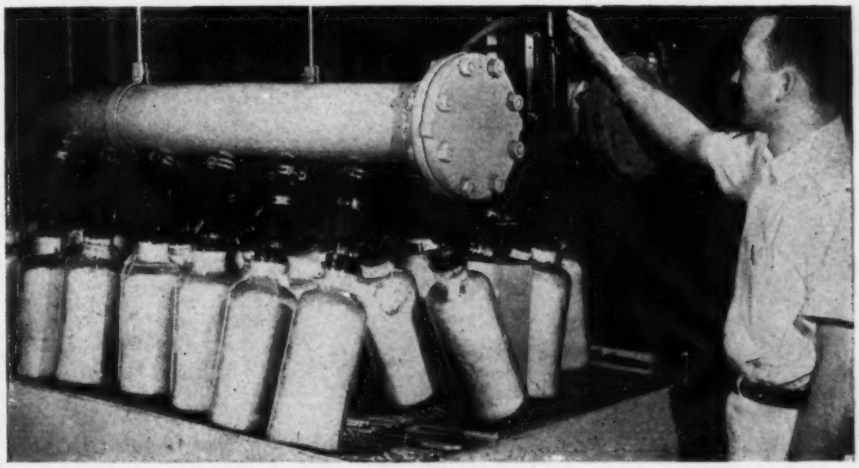
Indalone Continues Available for Civilian End Products

Following up its recent announcement of the availability of Indalone for civilian use, U. S. Industrial Chemicals Inc., is now offering technical assistance to companies interested in the manufacture of insect repellents. Significant progress in the field of insectifuges has been made as a result of the war and the necessity for carrying the fight to the enemy in many insect-infested areas. In its intensified research on a wide range of insectifuge products, U.S.I. has acquired "know-how" that should prove valuable to producers of insectifuges, suntan lotions and similar products in which it is desired to incorporate insect-repellent properties.

War Use

The war-time scarcity of Indalone has resulted from the tremendously stepped up demands of our Armed Forces. In the tropics, Indalone has rendered yeoman service in the fight against malaria. On practically every front, it has had a part in minimizing the insect menace that can have such serious effects on troop morale and fighting efficiency.

Indalone is a highly effective all-round repellent. It is easy to apply and its effect is long lasting. Indalone has some light-screening properties of its own and can also be combined with other light screening chemicals such as U.S.I.'s BK-5.



Dehydrating a protein fraction of blood at the Upjohn Laboratories. This is done from the shell-frozen state, under vacuum.

ADVERTISEMENT—*This entire page is a paid advertisement.*

August ★ **U.S.I. CHEMICAL NEWS** ★ 1945

Ethanol—Water Fractionating

(*Continued from preceding page*)

from plasma at a different ethanol-water proportion and at a different decreased temperature. For instance, the gamma globulin, which carries with it the immunizing anti-bodies separates from 20% ethanol-water solution at O C. Thus the desired protein fraction may be removed by the proper adjustment of solution and temperature, with minimum contamination from undesired protein fractions.

Shell-freezing Dehydration

For special uses, a dehydrated immune serum may be among the postwar developments. While it would require re-constituting with pyrogen-free water, it would enjoy certain advantages of stability and storability over the usual liquid serums.

Here the shell-freezing method of dehydration, put to large-scale use in blood plasma and penicillin processing, would come into use. This dehydration method takes advantage of the same principle which causes washing to dry faster when frozen on the line than it does in the summer. The substance to be dehydrated, whether plasma, penicillin or immune serum, is frozen at a temperature of about minus 25 C in a bath of ethanol and dry ice. Constant rotation of the bottles while freezing causes a shell of frozen material to form on the inside of the bottle.

Following shell-freezing, the dehydration takes place in a room where the temperature is maintained at a level low enough so that the shell remains frozen while a vacuum pump sucks the moisture from it. Vapor removed from the frozen shell is passed over a block of dry ice so that the moisture will condense on it and avoid formation of frost inside the vacuum pumps.

Other New Products

Uses are being developed for the other protein fractions of blood separated by ethanol-water fractionating. From fibrinogen, fibrin foam has been developed as a hemostatic agent to control bleeding. Fibrin films and plastics suggest many surgical uses. Gamma globulin, remaining after the separation of serum albumin from human blood serum, is finding use in the prevention and treatment of measles. Another fraction is used in the treatment of burns.

Any industry which works with proteins (for example, the adhesives industry) may discover ways to use this new ethanol-water fractionating at reduced temperatures.

Water-Repellent Fabrics Are Permanent, Washable

A newly patented process promises water-repellent fabrics which not only are soft and full fabrics, but washable ones as well. Described as permanent, this new finish for application to textiles is essentially a mixture of butanol-reacted melamine-aldehyde condensation product and a salt of an alkoxypropylamine.

In one method of preparation of the new finish, 3-N-octadecoxypropionitrile was hydrogenated at 110 C under a pressure of 800 to 1200 lbs. per sq. in. in the presence of a Raney nickel catalyst. The resulting product was largely converted into a secondary amine by the application of heat. This was dissolved in a solution of the butyl reaction product of tetramethylol melamine and a mixture of butyl alcohol and xylene.

Addition of water in sufficient quantities resulted in a fluid emulsion of the oil-in-water type. At 67 deg. F this emulsion becomes a paste which is diluted with several times its volume of water, and used as a fabric finish. The finish is cured by subjecting it to a temperature of 285 F for approximately four minutes.

At Lederle's Pearl River laboratories, plasma is dried using the principle that makes frozen wash dry faster. The first step, shown above, is to freeze a shell of plasma on the inside of the bottle by revolving the bottle in a bath of ethanol and dry ice. (Temperature, —70 C.)

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A new resin adhesive is described as a fast-setting, solvent-free, synthetic resin emulsion which not only acts as an adhesive for a wide range of materials, but also serves as a water-proof label overcoating. **(No. 963)**

USI

A zinc chromate replacement, said to be an excellent and inexpensive alternate for scarce zinc chromate, is described as a slate-gray graphitic muscovite compound found in mica crystals. **(No. 964)**

USI

Lacquer-removing cleansing cream, said to be free from toxic or explosive solvents is described as being for after-work application, and as making the use of masking creams unnecessary. **(No. 965)**

USI

A new germicide, for use in soap manufacture, is claimed to be effective against staphlococcus, and to be non-toxic and non-irritating. Product is said to be able to permanently reduce bacterial flora on the skin. **(No. 966)**

USI

To determine strain in plastics, a polarizer is described as being small, light-weight, simple in construction and easy to use. **(No. 967)**

USI

A new anhydride intermediate and compounding chemical, in which all four hydrogens in the phthalic anhydride molecule have been displaced by chlorine, is described as being a free-flowing, white, non-hygroscopic powder that melts at 254-255 C. As it is said to be non-toxic, it is recommended for pharmaceuticals as well as esters, plasticizers, coatings and so forth. **(No. 968)**

USI

A synthetic rubber cement, described as being about ½ stronger than cement made from natural rubber, is offered. **(No. 969)**

USI

Higher wet strength is claimed for glassine packaging papers produced by a new resin-impregnating process. These papers are available plain, laminated, waxed or lacquered. **(No. 970)**

USI

A new cellulose-acetate molding material is said to be flame-resistant, odorless, colorable, humidity resistant, and tough; it is recommended for injection molding. **(No. 971)**

USI

A new antiseptic, stated to be many times more potent than available sulfonamides is now offered in small quantities for experimental use. Product is said to be non-staining, effective in the presence of pus, and to have a wide bacterial spectrum. **(No. 972)**

USI

U.S.I. INDUSTRIAL CHEMICALS, INC.

60 EAST 42ND ST., NEW YORK 17, N. Y. — BRANCHES IN ALL PRINCIPAL CITIES

CHEMICALS · RESINS · ANTI- · USI SERVICE TO INDUSTRY · SOLVENTS · ALCOHOLS · FREEZE

ALCOHOLS
Amyl Alcohol
Butanol (Normal Butyl Alcohol)
Fusel Oil—Refined
Ethanol (Ethyl Alcohol)
Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof, C.P. 96%, Absolute
*Super Pyro Anti-freeze
*Solox Proprietary Solvent
***ANSOLS**
Ansol M
Ansol PR

ACETIC ESTERS
Amyl Acetate
Butyl Acetate
Ethyl Acetate
OXALIC ESTERS
Dibutyl Oxalate
Diethyl Oxalate
PHTHALIC ESTERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
OTHER ESTERS
*Diatol
Diethyl Carbonate
Ethyl Chloroformate
Ethyl Formate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloranilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate
ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.
FEED CONCENTRATES
*Curbay B-G
*Curbay Special Liquid
*Vacatone 40

ACETONE
Chemically Pure
RESINS
S&W Ester Gums—all types
S&W Congo Gums—raw, fused & esterified
S&W *Aroplaz—alkyds and allied materials
S&W *Arofene—pure phenolics
S&W *Arochem—modified types
S&W Natural Resins—all standard grades
OTHER PRODUCTS
Collodions
Ethylene Glycol
Nitrocellulose Solutions
Ethylene
*Ingalone
Urethan

*Registered Trade Mark

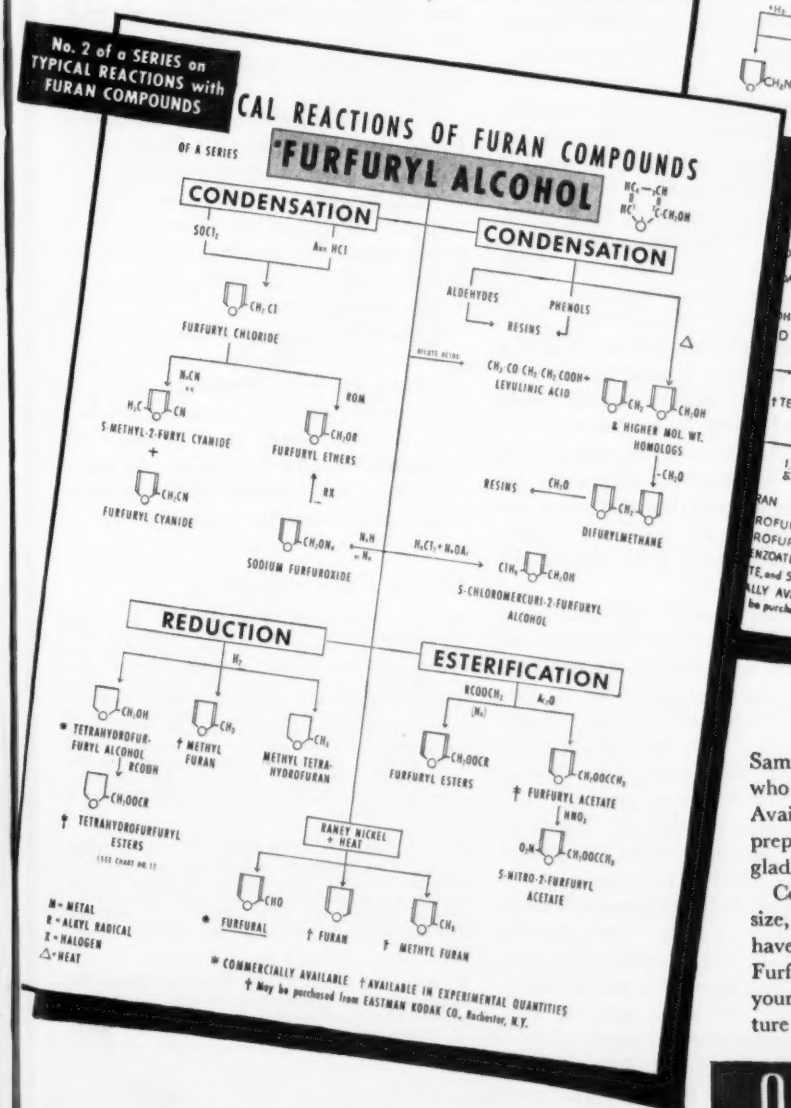
...U CAN DO SO MANY THINGS WITH FURFURYL ALCOHOL DOES SO MANY THINGS FOR YOU

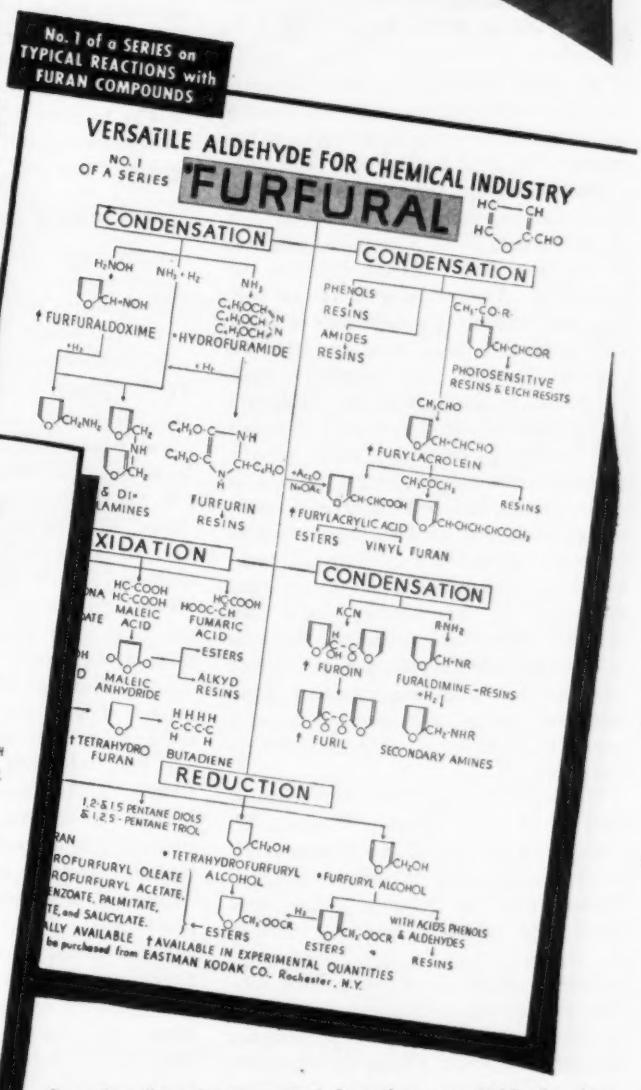
Here's a chemical with which you should become better acquainted. It is so versatile and its properties so diverse that it should be able to fit advantageously into your scheme of operations whatever they may be.

Of especial interest is its extreme reactivity and the many things you can do with Furfuryl Alcohol. A few of the typical reactions with Furfuryl Alcohol are indicated on the chart. Products of these reactions that are commercially available are indicated by an asterisk.

Supply of Furfuryl Alcohol is plentiful and it is available in two grades, technical and refined.

Our Technical Staff is ready to help on the application of Furfuryl Alcohol and the other Furans to your problems.





Samples of products marked * or † are available for those who see in them a possible application to their problems. Available data and literature references on properties and preparations of those compounds not yet available will be gladly furnished.

Copies of this chart in file size, 8½″ x 11″, or wall chart size, approximately 18″ x 24″, available on request. We still have available a limited number of wall charts (18 x 24) on Furfural Reactions. If you have not yet sent for one, send in your request now. Please send requests for samples or literature on your company letterhead.

The Quaker Oats Company — **CHEMICALS DEPT.**

1920 BOARD OF TRADE BLDG., 141 W. JACKSON BLVD. • CHICAGO 4, ILL.

FURFURAL • FURFURYL ALCOHOL • HYDROFURAMIDE • TETRAHYDROFURFURYL ALCOHOL

INDUSTRY'S BOOKSHELF

Rubber From Alcohol

SYNTHETIC RUBBER FROM ALCOHOL, *Anselm Talalay* and *Michael Magat*. Interscience Publishers, Inc., New York, 1945; 295 pp, $5.00. Reviewed by J. C. Elgin.

THE IMPORTANCE of and current interest in synthetic rubbers in this country lend significance to any contribution to this subject. Most of the scientific and technical information resulting from the intensive efforts in the U. S. in the past few years and data on U. S. technical practices in synthetic rubber manufacture are still restricted. An extensive literature will, however, undoubtedly eventually develop.

This book is based on a survey of the Russian literature. Consequently, it is concerned primarily with the chemistry and technology of the Russian methods for producing butadiene from alcohol, poly-butadiene polymerization, poly-butadiene rubbers, and the chemistry and technology of the sodium bulk polymerization processes. Emulsion polymerization techniques and copolymerization, of principal importance in this country, have been accorded only minor attention. As indicated by the title the book does not include processes for producing butadiene from petroleum sources. The information presented is, however, closely pertinent to these subjects.

The book is divided into four principal sections: I, The Lebedev Process; II, Technology of the S. K. Process; III, Polymerization; and IV, Physio-chemical Properties of the Polymer. About one-third of the subject matter is devoted to the physio-chemical properties of poly-butadiene polymers, including such subjects as physical, mechanical, and chemical properties of poly-butadiene, polymer structure, molecular weight and molecular weight distribution, plasticity, and the properties and viscosity of poly-butadiene solutions and cements. In dealing with the theoretical aspects of polymerization processes and polymer properties, the authors have drawn on the literature of other countries to supplement, coordinate, and interpret the Russian work. Based on butadiene, theories and mechanisms, as well as extensive experimental information for polymerization by different agencies and catalysts in the vapor and liquid phases and by bulk, solvent, and emulsion methods, are presented. This section is particularly well done and will be distinctly valuable to anyone interested in the field of polymerization and polymer properties and constitution.

The book is more than a literature survey and is actually a well coordinated and organized treatment of the respective subjects. The authors are to be commended in having accomplished an excellent presentation of a large body of chemical and technical information drawn from difficultly accessible sources. The volume will be of interest and importance to any worker in the field of synthetic rubber as well as to those who wish to gain some acquaintance with the chemistry and technology of this field.

Freshman Text

INTRODUCTORY GENERAL CHEMISTRY, third edition, *Stuart R. Brinkley*. The MacMillan Company, N. Y., 1945; 645 pp. Illustrated. $4.00. Reviewed by W. E. Cadbury, Jr., Haverford College.

THE THIRD EDITION of this book, like the first two, is characterized by sound scholarship and absence of frills. It is logical and reasonably rigorous, but not too difficult. It has perhaps less "color" than do many other books in the field. It is not recommended for "Survey Courses," but in the opinion of the reviewer, this is all to the good. There are even fewer illustrations in the third than in the second edition.

Comparison of this edition with the second shows that several changes in order have been made. Atomic theory has been advanced from Chapter 5 to Chapter 2. Although this change permits formulas to be introduced very early, the treatment, as a result, becomes much less logical. Most, if not all, of the other changes in order seem to be definite improvements.

The material on acids and bases, and electrolytes in general, is presented almost entirely in "modern" terms. Professor Brinkley's presentation is certainly not the last word, but he manages to avoid most of the many pitfalls which lie in the path of anyone who writes on this subject for beginning students. The words "ammonium hydroxide" and "carbonic acid," formerly quite respectable, are carefully avoided, but "apparent degree of ionization" is still present. Sodium hydroxide is not called a *base*, it is a *basic hydroxide*. The subject of hydrolysis probably suffers most from modern treatment. It was so much simpler, even though incorrect, the old way!

The description of metallurgical processes is good, and is made even more clear by generous use of outlines, or flow sheets. A livelier and more extended treatment of petroleum refining is one "frill' which could have been added without harm.

The author and the publisher have done a good job. Both as a possible text for the Freshman course, and as a volume for any chemist to own for reference and review, this book is heartily recommended.

Reviewing Plastics

THE NEW PLASTICS, *Herbert R. Simonds* and *M. H. Bigelow*, assisted by *Joseph B. Sherman*, Van Nostrand Company Inc., N. Y., 1945; 320 pp., $4.50.

A LARGE amount of usable material has been condensed into a very small space in this book The authors have first given a review of the industry up to 1940, following this with a survey of more recent developments. A discussion is then given of the established new materials and the improvements which have been made in established materials. To the reviewer it is rather difficult to see just where the dividing line between information contained under the titles, most recent developments, and, new materials, lies, however, this does not detract from the value of the information contained in these two chapters.

A fairly detailed discussion of the new border line plastic materials, fibers, adhesives, and laminating materials is also noted along with new applications of wood and paper as plastics base materials. Synthetic rubber and coating materials are also noted, the book closing with a chapter on plastics trends.

Certain small errors, inherent in a compilation of this type, were noted, such as not listing Hercules Powder Co. as a producer of ethyl cellulose or noting the fact that Bakelite Corp. is a producer of resorcinol-formaldehyde resins. In many ways this book reminds one of a rearranged plastics catalog without the ads.

Other Publications

POLYMER BULLETIN, Vol. 1, No. 1. This new bimonthly bulletin, which made its first appearance in April, is published with the cooperation of the Bureau of High Polymer Research, Polytechnic Institute of Brooklyn, New York. It provides a medium for the dissemination of information about the rapidly growing field of high polymers and particularly for the publication of summaries of the seminars and symposia held at the Institute. Published by the Interscience Publishers, Inc., 215 Fourth Ave., New York 13, N. Y., the subscription price is $2.40 a year.

PHARMACY by Dr. E. P. Guth. This monograph is one of a series of seventy-five occupational booklets designed for use in guidance in the choice of a career. It includes informative lists of associations and publications. Bellman Publishing Co., 6 Park Street, Boston, Mass., 50 cents.

CONTRACTORS GUIDE. The War and Navy Departments have prepared a 60-page outline for prime and subcontractors which suggests methods of advance planning, and procedures for settlement of terminated fixed-price supply contracts. Copies may be obtained without charge by written request to the Readjustment Distribution Center, 6th Floor, 90 Church Street, New York 7, New York; Attention: Lt. E. P. Lull.

IMPROVEMENT OF LABOR-UTILIZATION PROCEDURES, Bulletin No. 807. The United States Department of Labor, Bureau of Labor Statistics has printed a 44-page booklet, written from the standpoint of plant management. This is available through the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 10 cents.

Nice and Juicy

REMEMBER the days of the juicy steak? the dripping cuts of calf's liver? Few housewives then gave thought to what kept those juices where they belonged—*inside the wrapping paper.*

And, perhaps you in turn, have given little thought to the problems of efficiently getting the waxes where they belong—and what the solution of those problems can mean to you. For example, when you emulsify different waxes on a large scale—in water of varying degrees of hardness—you need a versatile set of emulsifiers. That, of course, is what Atlas Spans and Tweens are. That's why chemists use them so widely.

Extraordinary stability in the presence of salts and other electrolytes is just one property of Atlas Spans and Tweens. They make water-in-oil or oil-in-water emulsions—whatever is desired. They range from the completely water soluble to the completely oil soluble. They provide a wide range of compatibilities. Because of their chemical nature, an almost unlimited number of modifications and combinations is possible with them.

Think of Spans and Tweens in relation to your own emulsifying, wetting, spreading or detergent problems. If technical help is needed, we'll be glad to give it. As a starter, write for a free copy of the 20 page booklet illustrated at the right.

ATLAS SPANS AND TWEENS

Atlas Spans constitute a series of technical long chain fatty acid partial esters of hexitol anhydrides. The hexitol anhydrides include sorbitans and sorbides, mannitans and mannides.

Atlas Tweens comprise a series of polyoxyalkylene derivatives of hexitol anhydride partial long chain fatty acid esters.

Span and Tween: Reg. U. S. Pat. Off.

ATLAS INDUSTRIAL CHEMICALS DEPARTMENT

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • ***Offices in principal cities*** • ***Cable Address—Atpowco***

BOOKLETS & CATALOGS

Chemicals

A810. CHEMICALS. An alphabetical list of products of the Electrochemicals Department, E. I. du Pont de Nemours Co., together with general information regarding their properties and industrial uses, is contained in a 54-page booklet.

A811. ETHYL SILICATE. A 12-page booklet (Form 5989) giving a detailed discussion of the preparation of silica coatings by the hydrolysis of ethyl silicate is available from Carbide and Carbon Chemicals Corp.

A812. FIBER TREATMENT. "Effect of Resin Treatments on Spun Viscose Rayon Dyed with Calcomine and Calcodur Colors" titles a technical bulletin (No. 775) of the Calco Chemical Division of American Cyanamid Co.

A813. FINE CHEMICALS. Price list. Mann Fine Chemicals, Inc.

A814. FLOOR CLEANER. An illustrated 4-page folder describing their Floorlife Cleaner is now available from the Building Products Division, L. Sonneborn Sons, Inc.

A815. FUSED SILICA. The fused silica and fused quartz products of the Amersil Co. are described in a recent bulletin.

A816. HYDROCARBONS. A new 20-page bulletin (96B), describing the various available pure hydrocarbons, has been issued by the Special Products Division of the Phillips Petroleum Co.

A817. PEELABLE COATING. A 16-page illustrated book describing their peelable plastic film, "Liquid Envelope" has been issued by Better Finishes and Coatings, Inc.

A818. RESIN COATING. Fuzon-O, flexible vinyl resin coating, is the subject of a 12-page booklet issued by the Stanley Chemical Co.

A819. RESINS. A listing of properties and a description of the Durez resinous products are contained in an illustrated 4-page catalog of Durez Plastics & Chemicals, Inc.

A820. STANDARD AND TEST SOLUTIONS. Price list. Eimer and Amend Laboratories.

A821. SYNTHETIC RUBBER. The Hycar Chemical Co. has issued a 20-page illustrated booklet, "Everywhere in Industry," describing Hycar special purpose synthetic rubbers and their industrial usage.

Equipment—Methods

F416. CITRUS INDUSTRY. The Louisville Drying Machinery Co. Division of General American Transportation Corp. has issued an 8-page bulletin (No. 65) describing the profitable use of their equipment in the processing of citrus fruits.

F417. COMPRESSOR OPERATION. "The Effect of Supercompressibility of Natural Gas Upon Compressor Performance" titles a detailed 16-page booklet of the Clark Brothers Co.

F418. CONSULTANTS. A 4-page folder outlining the services and facilities of Sam Tour and Co., metallurgists, engineers, and consultants, is now available.

F419. DRUM DRYERS. "General American Drum Dryers" titles an 8-page bulletin (No. 250) of the Louisville Drying Machinery Co. Division of the General American Transportation Corp.

F420. ELECTRICAL INSTRUMENTS. The Marion Electrical Instrument Co. has issued an illustrated 12-page brochure describing the uses and advantages of Marion glass-to-metal hermetically sealed electrical instruments.

F421. ELECTRODES. The entire line of Airco electrodes as well as information concerning their usage are discussed in a 56-page book of the Air Reduction Co.

F422. FABRIC BEARINGS. The various types and sizes in which Gatke moulded fabric bearings are being produced are noted in a 68-page brochure of the Gatke Corp.

F423. GOGGLE CLEANER. The Allen goggle station for cleaning and fog-proofing glasses and goggles is described and illustrated in a recently issued 4-page folder. Allen Optical Co.

F424. INDUSTRIAL PACKINGS. A pocket-size folder giving condensed descriptions of each grade of Palmetto Packing is available from Greene, Tweed & Co.

F425. INSTRUMENTS. The Hays Corp. has issued a 26-page booklet, "Hays Instruments and Controllers in Industry" in which their various instrument controllers are illustrated and described in detail.

F426. JACKS. Suggestions for the maintenance and repair of Simplex lever and hydraulic jacks along with a list of repair parts and prices are contained in a 48-page catalog (No. 45) issued by Templeton, Kenly & Co.

F427. LEAD FITTINGS. Specifications and drawings for the Asarco line of lead fittings of the Lead Products Division of the American Smelting and Refining Co. are described in a 24-page booklet.

F428. LEAD-LINED PIPE. "Asarco Expanded Lead-Lined Steel Pipe" titles a 20-page booklet of the American Smelting and Refining Co.

F429. MAGNETIC PULLEYS. Specifications of Dings air-cooled magnetic pulleys and a detailed description of their use in many industries are covered in a 32-page catalog (No. 260) issued by the Dings Magnetic Separator Co.

F430. PIPE WELDING. A 4-page folder ttled, "What Kind of Pipe Welding Do You Want?", has just been issued by Cornell and Underhill, Inc.

F431. PLANT LOCATION. "Let's Look at Portland" titles a 48-page book giving factual information concerning the business possibilities in Portland is available from the Portland Chamber of Commerce.

CHEMICAL INDUSTRIES TECHNICAL DATA SERVICE

Chemical Industries, 522 Fifth Ave., New York 18, N. Y. (8-5)

I would like to receive the following free booklets or catalogs:

A810	A817	F148	F425	F432	F439
A811	A818	F419	F426	F433	F440
A812	A819	F420	F427	F434	F441
A813	A820	F421	F428	F435	F442
A814	A821	F422	F429	F436	F443
A815	F416	F423	F430	F437	F444
A816	F417	F424	F431	F438	

Name .....

Company .....

Street .....

City & State .....

For Assured Valve Performance

Consult POWELL ENGINEERING *First*

Shooting quail with a bazooka would be nonsensical. But trying to make a valve do a job for which it is not suited doesn't make much sense, either.

For assured performance in flow control the valve *must fit the job.*

That's why Powell maintains a staff of valve engineers who are always at your service for consultation and advice. And if you have any individual flow control problems, Powell Engineering is ready to design the correct valves to meet them.

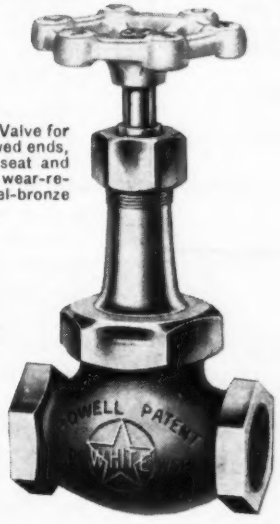


Fig. 1708—Bronze Globe Valve for 200 pounds W. S. P. Screwed ends, union bonnet, renewable seat and regrindable, renewable, wear-resisting "Powellium" nickel-bronze semi-cone, plug type disc.

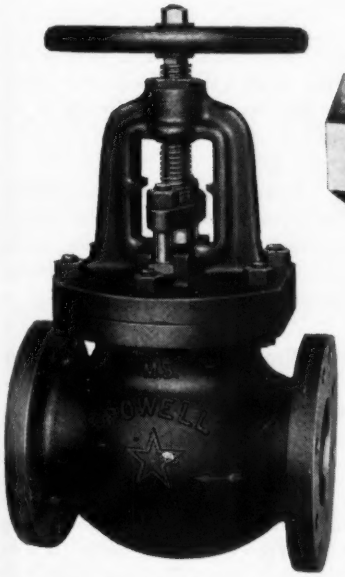


Fig. 241—Iron Body Bronze Mounted Globe Valve for 125 pounds W. S. P. Flanged ends, outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc.

Fig. 1561—Class 150-pound Cast Steel Swing Check Valve. Flanged ends and bolted cap. Disc has ample lift to permit full, straightway unobstructed flow through the valve body.

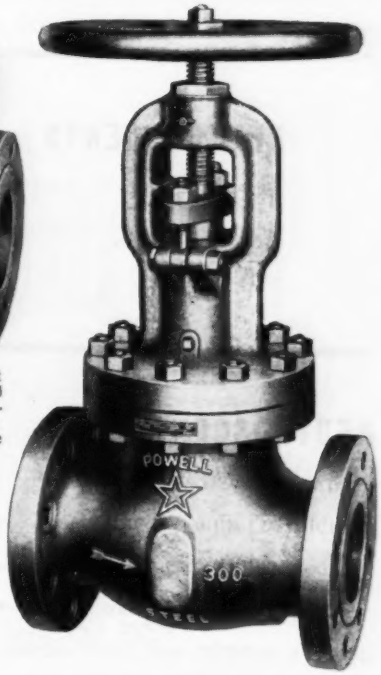


Fig. 3031—Class 300-pound Cast Steel Globe Valve. Flanged ends, outside screw rising stem and bolted flanged yoke.

The Wm. Powell Co.

Dependable Valves Since 1846

Cincinnati 22, Ohio

DISTRIBUTORS IN PRINCIPAL CITIES

POWELL VALVES

Announcing NEUTROSCENTS

. . . . A new group of aromatic compounds designed to accomplish these two results:

1. **NEUTRALIZE OFFENSIVE ODORS and**
2. **SUBSTITUTE REFRESHING SCENTS**

NEUTROSCENTS have a wide range of usefulness, both as deodorants and re-odorants or fresheners for contaminated atmosphere. Such applications would include use in hospitals, sick rooms, theatres, smoking rooms, kitchens, restaurants, convention halls, institutions, refuse disposal plants, janitor's supplies and countless others.

NEUTROSCENTS are adaptable to every practical method of dispersion, i.e., by simple open receptacles, by spraying devices, by aerating and air conditioning units and other dispersion and evaporation devices.

NEUTROSCENTS are now available in TEN appealing odors, each in THREE different forms (Concentrated, Water Soluble and Solubilized) thus providing a wide and varied selection of odorizing compounds for the prospective user. If interested in some specific use, either for immediate or post-war development, write us for suggestions, samples and other details.

FRITZSCHE BROTHERS, Inc.

PORT AUTHORITY COMMERCE BLDG., 76 NINTH AVENUE, NEW YORK 11, N.Y.

BRANCH STOCKS

BOSTON CHICAGO LOS ANGELES ST. LOUIS TORONTO, CANADA MEXICO, D. F.

FACTORIES AT CLIFTON, N. J. AND SEILLANS (VAR) FRANCE

F432. PUMPS. The type "SHB" ball and sleeve bearing centrifugal pumps of the Yeomans Brothers Co. are pictured and described in a 4-page folder.

F433. PUMPS. A 20-page booklet giving a detailed description of the various types of centrifugal pumps has been prepared by The Deming Co.

F434. PUMPS. The Type GRJ steam-jacketed rotary pumps are described, with specifications, in a 4-page folder of the Worthington Pump and Machinery Corp.

F435. PUMPS. The Nofome sanitary pumps are described with specifications in a 12-page bulletin (9D) of the Specialty Brass Co.

F436. RECORDER. A folder (No. OP 1502) giving the principles and operation of the newly developed machine running time recorder of the Bristol Co. is now available.

F437. REFRIGERATION UNIT. Specifications of the "S" Type 4HF6 refrigeration unit for use with Freon-12 or methyl chloride are given in a leaflet issued by the Worthington Pump and Machinery Corp.

F438. ROTARY DRIERS. An 8-page bulletin describing Louisville direct heat rotary dryers is now available from the Louisville Drying Machinery Co. Division of the General American Transportation Corp.

F439. SPRAY GUNS. A 22-page booklet on the Lonn rubber blow and spray guns has just been published by the B. F. Goodrich Co.

F440. THERMOCOMPRESSORS. "Steam-Jet Thermocompressors Supply Intermediate-Pressure Processes" titles an 8-page booklet of the Worthington Pump and Machinery Corp.

F441. WATER SEPARATOR. The Lewis Excel-so water separator and filter, developed for use with petroleum fuels, is described in a 4-page booklet, issued by Flotrol Systems, Inc.

F442. WIRE BELT HOOK. A new type of hinged-type wire belt hooks is described in Bull. No. 737 of the Mill Supply Division of the Bristol Co.

F443. X-RAY DIFFRACTION. A 29-page booklet of the Picker X-Ray Corp. explains the application of the X-Ray diffraction and the interpretation of diffraction radiographs.

F444. X-RAY UNIT for low voltage work, described in a 12-page booklet of the Picker X-Ray Corporation.

PROTECT YOUR CHEMICALS

SHIP IN Fulton WATERPROOF BAGS

PREVENT DAMAGE FROM MOISTURE OXIDATION & ABRASION

It is more important than ever before that there shall be no loss from waste. Chemicals carry safely and well in Fulton Waterproof Bags. They protect the contents from moisture and sifting. Fulton Waterproof Bags are sturdy and easy to handle and store. Estimate your requirements and let us have your inquiry.

FULTON BAG & COTTON MILLS

Manufacturers since 1870

Atlanta · St. Louis · New York · New Orleans
Denver · Minneapolis · Dallas · Kansas City, Kans.

Petroleum Sulfonates

waxes
CERESINES, WHITE AND YELLOW

white oils
petrolatums
RUST PREVENTIVES

THE REFINERY OF CONTROLLED SPECIALIZATION
SHERWOOD
REFINING COMPANY, INC.
ENGLEWOOD, N. J. REFINERY, WARREN, PA.

SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.
REG. U. S. PAT. OFF.

MURIATE OF POTASH
62/63% K_2O ALSO 50% K_2O

MANURE SALTS
22% K_2O MINIMUM

UNITED STATES POTASH COMPANY
Incorporated
30 Rockefeller Plaza, New York, N.Y.

IS THERE A NEW "BABY" IN YOUR COMPANY?

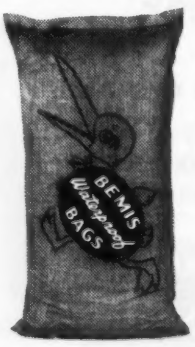
Have you a new product? Is it in powdered, granular, pebble, crystal or lump form? Does it require protection against moisture loss or absorption . . . loss of aroma or absorption of odors . . . dirt, sifting or contamination?

If you have a product like this, the Bemis Waterproof Bag is probably the ideal container. For years Bemis Waterproof Bags have provided manufacturers of many diversified products with these cost-saving advantages:

- *Bemis Waterproof Bags cost less than other containers that give the same protection.*
- *Filled or empty, they save valuable storage space.*
- *The light weight of Bemis Waterproof Bags means economies in shipping costs.*

Investigate the possibilities of Bemis Waterproof Bags as containers for your company's new "baby." Mail coupon below for interesting booklet, "A Guide to More Efficient Shipping."

If you desire, one of our representatives will call to discuss your packaging problems. Naturally, there is no obligation.



Get the Benefits of Scientific Bag Selection

Bemis Shipping Research Laboratory will determine the proper bag type for you — make tests to insure that materials specified will stand up under the packing, shipping and handling conditions your product will encounter — and maintain a constant check on these materials to make sure these rigid specifications are met.

WATERPROOF DEPARTMENT

BEMIS BRO. BAG CO.

St. Louis • Brooklyn

BEMIS BRO. BAG CO.,
408-J Pine St., St. Louis 2, Mo.;
5122 Second Ave., Brooklyn 32, N. Y.

Please send your special booklet, "A Guide to More Efficient Shipping" and details about use of Bemis Waterproof Bags for_____
(PRODUCT)

*Name*_____

*Company*_____

*Street*_____

*City*_____ *State*_____

NEWS OF THE MONTH

National Research Program

Vannevar Bush proposes $33,000,000 federal financial support for basic research and scientific education. Program would be administered by a National Research Foundation named by President.

ESTABLISHMENT of a National Research Foundation by Congress for the purpose of promoting a national policy for scientific research and scientific education has been proposed by Vannevar Bush, director of the Office of Scientific Research and Development, in a report submitted to the White House.

The program, which calls for federal financial support of research in educational institutions and non-profit organizations as well as for scholarships and fellowships as part of a plan for developing scientific personnel, will cost about $33,000,000 a year at the outset and may rise gradually thereafter, according to an estimate by Dr. Bush.

The foundation he suggests would consist of nine members to be selected by and be responsible to the president. They would serve four years, without compensation. The divisions of the foundation would be: medical research, natural sciences, national defense, scientific personnel and education, and publications and scientific collaboration.

The report, prepared at the request last November of President Roosevelt, is based upon the recommendations of leading scientists, educators, industrialists, and government officials, and was prepared after nine months of intensive study.

Several bills based on the report by Dr. Bush calling for the establishment of a National Science Foundation designed to promote the progress of science, to secure the national defense, and to advance the national health, have been introduced into the Senate. Senator Warren G. Magnuson's (Washington) bill has been referred to the Senate Committee on Commerce. He stated that he hoped hearings on his bill would be held early in the fall, and that legislation would be enacted this year. Senators Kilgore (West Virginia), Pepper (Florida), and Johnson (Colorado) have introduced a similar bill.

Dr. Bush said in his report: "Early action on these recommendations is imperative if this nation is to meet the challenge of science in the crucial years ahead. On the wisdom with which we bring science to bear in the war against disease, in the creation of new industries, and in the strengthening of our armed forces depends, in a large measure, upon our future as a nation."

Dr. Bush stressed the necessity of having the Government provide suitable incentives to private industry in conducting research, and urged modification of certain provisions of both the Internal Revenue Code and the patent system. On this point, he said:

"The Government should help industry in its research projects by clarifying present uncertainties in the Internal Revenue Code in regard to the deductability of research and development expenditures as current charges against net income, and by strengthening the patent system so as to prevent abuses which reflect discredit upon a basically sound system. In addition, ways should be found to cause the benefits of basic research to reach industries which do not now utilize new scientific knowledge."

The release of war-developed scientific knowledge as soon as it is expediently possible, so that much of it can be used by industry and by colleges and universities and in training young scientists, was urged by Dr. Bush.

WPB Cancels Toluene Plant Plans

The War Production Board has announced that the War Department has cancelled a contract for a $20,000,000 toluene plant at Lake Charles, La. The project was authorized last March and was to have been completed by next January.

The plant was to have been operated by Cities Service Refining Corp. No reason for the cancellation was given.

Chemical Exposition Postponed to 1946

The 19th annual Exposition of Chemical Industries, normally scheduled for the end of November in New York, is tentatively planned for the early part of 1946. In an effort to cooperate with the government and the ODT War Committee on Conventions, announcement of a definite date for the exposition is being delayed until it is possible to foresee conditions with a greater degree of certainty, according to Charles F. Roth, manager of the exposition.

It is hoped that the exposition can be held sometime between January and April, 1946. Exhibitors have been asked to make tentative plans so that the show may be developed in the shortest possible time.

Standard Oil Names Bruce K. Brown

Bruce K. Brown, recently re-elected as a director and promoted to a vice-presidency in the Standard Oil Co. (Indiana), has announced the regrouping of the research and development staff. Moving from the Whiting laboratories to the general office in Chicago are D. P. Barnard and J. H. Forrester.

"Trust Busters" Fine 19 Concerns

Nineteen chemical companies have been fined a total of $142,500 in Federal Court at Hammond, Ind., when they did not contest indictments charging anti-trust law violations.

Six indictments were returned June 26, 1942, charging price-fixing and control of production and distribution in the sale of acids.

Following is a list of the fines imposed by Judge William H. Holly:

E. I. du Pont, Wilmington, Delaware, $22,500; General Chemical Co., New York, $15,000; Mutual Chemical Co., New York, $12,500; Victor Chemical Works, Chicago, $12,500; Dow Chemical Co., Midland, Michigan, $10,000; the Martin Dennis Co., Newark, N. J., $10,000; Monsanto Chemical Co., St. Louis, $9,000.

American Cyanamid & Chemical Corp., New York, $7,500; Prior Chemical Corp., New York, $6,000; Stauffer Chemical Co., New York, $5,000; Pennsylvania Salt Manufacturing Co., Philadelphia, $5,000; Oldbury Electro-Chemical Co., Niagara Falls, New York, $5,000; Natural Products Refining Co., Jersey City, N. J., $5,000; the Harshaw Chemical Co., Cleveland, $5,000.

Atlas Powder Co., Wilmington, $3,000; Davison Chemical Co., Baltimore, $3,000; South-

ern Agricultural Chemical Corp., New York, $3,000; Innis, Speidan & Co., New York, $2,500; F. S. Royster Guano Co., Norfolk, Va., $1,000.

William W. Schneider, secretary and corporate attorney of the Monsanto Chemical Co., has stated that the company had not been guilty of violations of the anti-trust laws and that the plea of no contest was entered because it enabled the company to dispose of the case at a cost of only $9,000. He said that the alternative would be a trial of several months, with expenses of over $100,000.

Kunz Joins Borden Special Products

Raymond J. F. Kunz has joined the Special Products Division of the Borden Co. as chemical engineer, according to vice-president C. F. Kieser. Prior to joining the Borden company, Dr. Kunz was director of engineering development for Hoffmann La Roche, Inc., and formerly directed the National Defense Research Committee project at Northwestern University.

India Considers Plan For Research Units

A plan has been proposed by the Indian Government for the establishment of five national laboratories for chemical, physical, metallurgical, glass and fuel research, according to the Department of Commerce.

The planning and development member of the Government recently reported that a recommendation for a tax to be levied on industries to finance large-scale scientific research is under consideration.

Hardvard Honors

At the 294th Commencement of Harvard College on June 29, Bradley Dewey, president of the Dewey and Almy Chemical Company, Cambridge, Mass., received the honorary degree of Doctor of Laws.

WPB Chooses Scrap Rubber Consultant

Albert B. Buxbaum, general manager of the Buxbaum Co., Canton, Ohio, has been named to the staff of the Rubber Bureau of the War Production Board, as a consultant on scrap and reclaim rubber, according to W. James Sears.

Activities of the U. S. Conciliation Service

Situations Disposed of in the Chemical Industry

	Number		
	1945		1944
Type of Situation	May	April	May
Total	67	57	77
Labor Disputes	65	52	67
Strikes and Lockouts	6	6	..
Threatened Strikes	3	8	..
Controversies	56	38	..
Other Situation	2	5	10
Arbitrations	..	3	..
Technical Services	..	..	..
Special Services	2	2	..
Disputes Certified to National War Labor Board	18	10	..

Electron Microscope Inventor Sues for Patents

Reinhold Rudenberg, who claims to be the inventor of the electron microscope, has started legal action in Federal Court, Boston, Mass., against the Alien Property Custodian, and against his former employer, Siemens-Schuckertwerke, for the return of U. S. patents covering the essential specifications for the device.

The patents, U. S. 2,058,914 and 2,070,319, were issued in 1936 and 1937, with priority rights in Germany as far back as 1931. Although Professor Rudenberg was chief engineer of Siemens at the time he made the inventions, he deposes that the concern has no rightful claim to his patents. He left that company in 1936 and after about two years in England came to America.

He is now Gordon McKay Professor of Electrical Engineering at Harvard University.

Standards Committee Planning Starts

The United Nations Standards Coordinating Committee has received requests for international work on the following:

1. Standardization of terms used in the plastic industry requested by the British Standards Institution.
2. Permissible filling ratios and pressures for cylinders carrying various commercial and industrial gases, requested by the Standards Association of Australia.
3. Unification of national terms and definitions for heat treatment of steel suggested by the British Standards Institution.
4. An international dictionary of terms used in trade of commodities, facilities, services, etc., suggested by the New York office of the United Nations Standards Committee as a result of conferences with government officials in Washington and Canada.

All of these suggestions have been considered by ASA representatives, but since they are still in the planning stage no action has been taken. In some cases they have been referred to ASA member organizations for further study before any decision is made as to whether the ASA should participate. In some cases they have been referred to committees of the American Standards Association for investigation and report.

Moore, Reid, Shepard Named Consulting Editors of C. I.

Drs. R. J. Moore, E. W. Reid, and N. A. Shepard have accepted appointments to the consulting editorial board of CHEMICAL INDUSTRIES, where they will serve along with the present members, R. T. Baldwin, B. T. Brooks, L. W. Bass, C. R. Downs and J. V. N. Dorr, in an advisory capacity on editorial matters.

Dr. Moore is technical coordinator of the Bakelite Corp. and Dr. Shepard is chemical director of the American Cyanamid Co. Dr. Reid is vice-president in charge of the chemical division of Corn Products Refining Co. and former director of the chemicals branch of the War Production Board.

CALENDAR *of* EVENTS

Scheduled

NEW ENGLAND ASSOCIATION OF CHEMISTRY TEACHERS, Seventh Annual Conference, Massachusetts State College, Amherst, Mass. August 9 to 13.

OPTICAL SOCIETY OF AMERICA, 30th Annual Meeting, Hotel Pennsylvania, New York. October 18 to 20.

Postponed

THE PLANT SCIENCE SEMINAR, 23rd Annual Meeting, Week of September 3.

Wyandotte Promotes Executives

Thomas E. Vaughn, former assistant director of research of Wyandotte Chemicals Corp., has been appointed director of research, succeeding Howard F. Roderick who will take over important new responsibilities in the sales department of the company.

Sugar Research Foundation Fosters Research

Additional grants amounting to more than $50,000 for seven leading universities and laboratories have been announced by Robert C. Hockett, scientific director of the Sugar Research Foundation, bringing the total to more than $300,000.

Recipients of these grants include McGill University Medical School, The University of Pittsburgh, Yale University Medical School, The University of Utah, New York University Medical School, Cornell University Medical School and Brooklyn Polytechnic Institute.

The studies will seek new industrial uses of sugar and further explore the nutritional values of sugar.

Dr. Hockett announced grants to the following: Dr. Gebhard Stegeman, pro-

fessor of physical chemistry at the University of Pittsburgh, $7,000, to collate all existing data and carry out new measurements of the physical properties of sugar and sugar solutions for use by industrial chemists.

Drs. F. W. Zerban and Louis Sattler of the New York Sugar Trade Laboratory, $4,000, for further investigation of the unfermentable constituents of molasses.

Dr. George R. Cowgill, professor of nutrition at Yale University Medical School, $3,600, to survey the vitamin content of various products of the sugar industry at the point when they reach the market.

Drs. Walter D. Bonner and Ralph F. Phillips of the Chemistry Department at the University of Utah, $1,500, to study production of certain glucose derivatives directly from sugar and molasses.

Dr. Hans Selye, associate professor of histology at McGill University Medical School, $10,000, for a three-year study of the effects of diets in protecting animals from the effects of over-activity of the endocrine glands.

Dr. I. M. Rabinowitch, associate professor of medicine at McGill University and Director of the Department of Metabolism at the Montreal General Hospital, $10,000, for investigation of the use of sugars in human nutrition in health and in disease.

INDUSTRY ADVISORY COMMITTEES

Civilian Alkyd Allocations Tight

Current military requirements that have not been met and increasing demands for alkyd resins to be used for the war in the Pacific theatre indicate that alkyd resins will be allocated chiefly to the military throughout the remainder of 1945, representatives of the War Production Board's Chemical Bureau told the members of the Alkyd Resins Industry Advisory Committee.

WPB pointed out that phthalic anhydride continues to be the limiting factor in the availability of alkyd resins. Although new production is being brought into operation as rapidly as possible, the increased output will be channeled to the military first.

The committee indicated that there is a considerable demand for alkyd resins to be used as coatings on refrigerators, washing machines, stoves, automobiles and other essential civilian production currently planned by WPB. The committee said it felt that consumers would not readily accept coatings of inferior quality as compared with alkyd resin coatings used in the pre-war period and that this might retard conversion. Civilian production of these items may be seriously delayed unless alkyd resins are made available for such coatings, the committee emphasized.

Sulfuric Acid Supply Ample

The supply of sulfuric acid is adequate to meet all requirements, War Production Board officials told the members of the Inorganic Acids Industry Advisory Committee at a recent meeting.

It was the opinion of the majority of the committee members that within the next two months controls should be lifted from the allocation of sulfuric acid, except in Area 10, WPB said. The committee indicated that it would be advisable to continue allocation of sulfuric acid in Area 10 until V-J day.

WPB pointed out that the distribution problem in Area 10, which includes Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Idaho, Washington, Oregon and California, is such that continued allocation would be beneficial to consuming and supplying industries. The distribution problem in the western area is most acute in California, they added.

Increased Dyestuff Allotments Asked

Increased allotments of dyestuffs to enable buyers of fabrics to broaden their civilian operations was recommended to the War Production Board at a recent session of the Dyestuff Manufacturers Industry Advisory Committee.

Specifically, the committee recommended increasing the quota on Class B, C and D dyes available to the industry. The dyes have been controlled in M-103 (Dyestuffs and Organic Pigments) on a quota basis, figured on a percentage of the dye used during 1941.

The recommendation grew out of complaints from dyers who said that under the quota restrictions they were prevented from purchasing additional dyestuff when they had a surplus of undyed goods that could be turned into the civilian market.

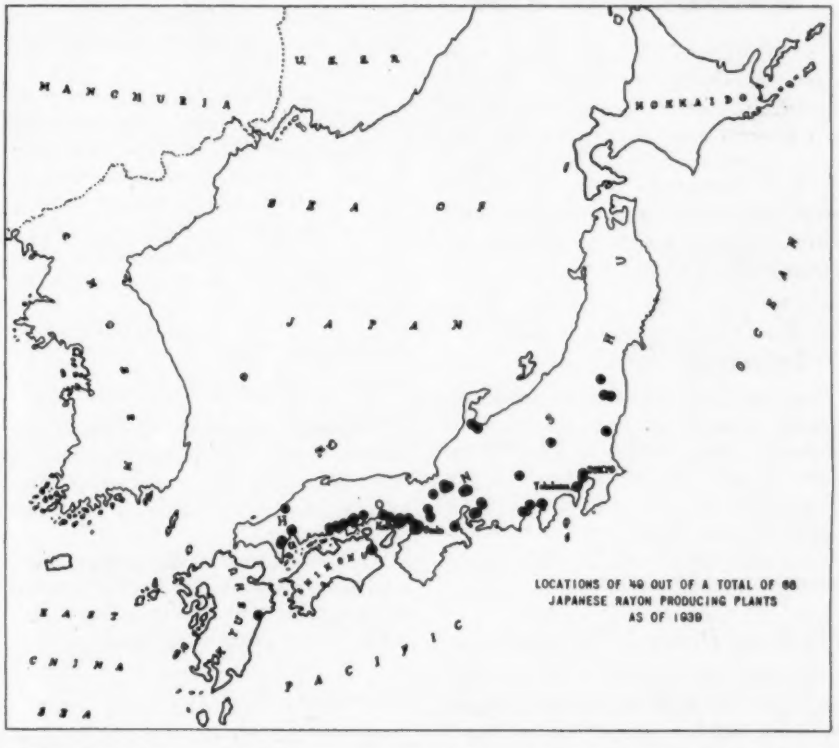
Phosphate Control Retention Recommended

Retention of controls on the allocation of sodium phosphate for at least four more months was recommended by the Sodium Phosphate Manufacturers Industry Advisory Committee.

The committee recommended that the supply and requirements pattern be reviewed in four months to determine the advisability of removing allocation controls at that time.

The supply of phosphorus is at present inadequate to meet all military and essential civilian requirements, WPB stated.

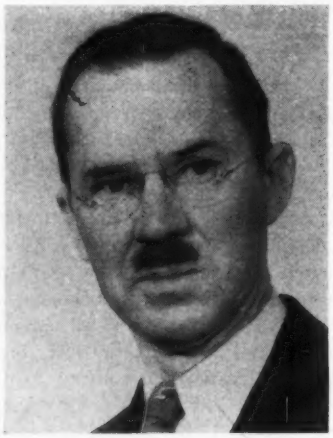
Bombings Reduce Threat of Japanese Rayon Competition



This map shows the Japanese rayon industry to be concentrated in the southern and eastern sections of Honshu. The current Super Fortress bombings of these industrial centers around Tokyo and Yokohama, plus the future bombing of other industry areas, undoubtedly will eliminate the threat of cheap rayon from Japan after the war.

Completion of an additional furnace in the future is expected to relieve the situation somewhat.

Minnesota Mining Promotes Taylor



Dr. Nelson W. Taylor has been appoined to the post of technical assistant to the director of research of the Minnesota Mining & Manufacturing Company. In addition, he will also continue as head of the ceramics section.

COMPANIES

Tanner Organizes Company

Organization of the Tanner Chemical Company, for the manufacture of industrial chemicals for rustproofing processes, has been announced today by Robert R. Tanner, president.

The firm is located at 109 East Nine Mile Road, in Ferndale, with laboratories in Berkley, Mich. Mr. Tanner was formerly director of research for Parker Rustproof Company. He is known as the inventor of the well-known Bonderite process, as well as some twenty other patents in the rustproofing field.

Mathieson Increases CO Production

The completion of a $400,000 addition to Mathieson's Saltville carbon dioxide plant has been announced by George W. Dolan, president of The Mathieson Akali Works.

The new addition increases production of solid and liquid carbon dioxide by more than 50 per cent.

Ore and Chemical Corp. Stock to Be Sold

Francis J. McNamara, Deputy Alien Property Custodian, has announced that the Custodian has invited sealed bids for the purchase of all the outstanding stock of the Ore and Chemical Corp., 80 Broad Street, New York, N. Y., and for 3.89 per cent of the capital stock of the Pembroke Chemical Corp., Pembroke, Fla. The two lots of stock will be sold separately.

Bids on the property will be received until 12 noon, August 10, 1945, by the Office of Alien Property Custodian, 120 Broadway, New York 5, N. Y.

J. T. Baker Plans Plant Expansion

The J. T. Baker Chemical Company has acquired an industrial site of 275 acres, situated in New Jersey along the Delaware River, north of its present Phillipsburg plant. The site has been acquired as a first step in a post-war in-industrial expansion.

Tuley Manages U. S. Rubber Co. Sales

Dr. William F. Tuley, plant manager, Kankakee Ordnance Works, Joliet, Ill., has been appointed assistant general sales manager of Naugatuck chemical division, United States Rubber Company. John W. Ackerman, former assistant plant manager, has been appointed plant manager replacing Dr. Tuley.

G. E. Inaugurates Scholarship Fund

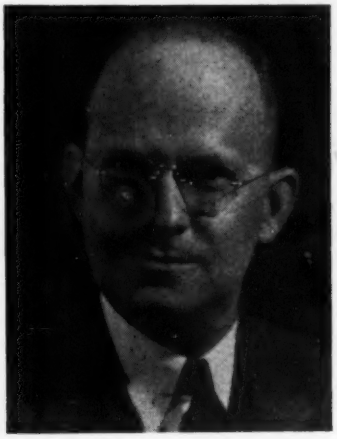
To assist in higher education and fundamental research work in scientific and industrial fields, a fund of $400,000 has been set aside by the directors of the General Electric Co. to be known as the Gerard Swope Foundation. Mr. Swope served as president of General Electric for more than 19 years.

Holland Plant Liberated

Although free communication with Holland is not yet established, National Starch Products, Inc., has learned that its Dutch plant, Nationale Zetmeelindustrie N.V. of Veendam, Holland, was liberated April 14th by Polish troops of the Canadian First Army. The plant is reported to be undamaged despite its proximity to Groningen where heavy fighting occurred; and all of its personnel are said to be safe.

It is expected that the Veendam plant will shortly resume the manufacture of potato starches, dextrins and liquid adhesives.

Cordle to Direct Iodine Bureau



Harry J. Cordle has been appointed vice-president and director of the Iodine Educational Bureau, Inc. He succeeds Herbert C. Brewer of the Chilean Nitrate Educational Bureau, Inc.

Calco Buys Jersey Plant

The Calco Chemical Division of the American Cyanamid Company at Bound Brook, New Jersey, has purchased, at public auction, the Gloucester City, New Jersey, plant of the Sherwin-Williams Company.

Sherwin-Williams bought and equipped this plant approximately five years ago for experimental production of titanium dioxide. As these experiments were recently completed the company had no further use for the plant.

Ames Hettrick, manager of the Piney River plant, will also be the manager of the new plant.

Monsanto Plans Unit at Boston

Monsanto Chemical Company announced today that it will construct a $450,000 unit for the production of Santocel, at its Merrimac Division plant just outside Boston.

Work on the new facility will get under way immediately, and it is expected that the new unit will be operating at full capacity by the end of the year.

Company Notes

International Paper Products Division of INTERNATIONAL PAPER COMPANY has opened a branch sales office in Pittsburgh at 1026 Farmers Bank Building. Robert W. Lillis is district sales manager and his territory covers the State of Penn-

THE TENNANT GROUP OF COMPANIES

ESTABLISHED 1797

Unique in Their Widespread Activities

. 1 .
CHARLES TENNANT & CO., LTD.
Glenconner Works, North Hillington, Glasgow, S.W.2
CHEMICALS, SOLVENTS, CEMENTS, COAL TAR PRODUCTS

. 2 .
CHARLES TENNANT & CO., LTD.
94 Royal Avenue, Belfast
CHEMICALS, FERTILISERS, CEMENTS, COAL TAR PRODUCTS

. 3 .
CHARLES TENNANT & CO. (EIRE), LTD.
1-3 Westmoreland Street, Dublin
CHEMICALS, FERTILISERS, CEMENTS, COAL TAR PRODUCTS

. 4 .
C. TENNANT SONS & CO., LTD.
66, Cheapside, London, E.C.2
CHEMICALS, CALCIUM CARBIDE, FERROUS AND NON-FERROUS METALS AND ALLOYS, FERTILISERS, POTASH, SILICA SAND, WOOD PULP, RUBBER, PRODUCE

. 5 .
TENNANTS (LANCASHIRE), LTD.
1 Booth Street, Manchester 2
CHEMICALS, DRYSALTERIES, TANNING MATERIALS, RAW MATERIALS FOR THE TEXTILE INDUSTRIES

. 6 .
PAN BRITANNICA INDUSTRIES, LTD.
Britannica Works, Waltham Abbey, Essex
FERTILISERS, INSECTICIDES, DISINFECTANTS

. 7 .
BARTER TRADING CORPORATION, LTD.
14 Waterloo Place, London, S.W.1
CHEMICALS, SOLVENTS, FORMALDEHYDE, SYNTHETIC CEMENTS AND RESINS

. 8 .
SYNTHITE, LTD.
Ryder's Green, West Bromwich
FORMALDEHYDE, PARAFORMALDEHYDE, ANTI-FREEZE, SOLVENTS

. 9 .
ADPRINT, LTD.
6 Newman Street, London, W.1
BOOK DESIGN AND PRODUCTION, COLOUR PRINTING

. 10 .
ASTROPLAX, LTD.
143 York Road, Belfast
FINISHING PLASTERS AND LYTOLL PARTITION BLOCKS

. 11 .
IRISH TAR DISTILLERS, LTD.
Oriel Street, North Wall, Dublin
TAR AND TAR BY-PRODUCTS, CREOSOTE

. 12 .
MARINE AND FACTORY SUPPLIES, LTD.
Albert Works, Greenland Street, Liverpool 1
SHIP CHANDLERS, BUILDERS' MERCHANTS AND STOCKISTS

. 13 .
SALERMO, LTD.
14 Waterloo Place, London, S.W.1
RETORTS FOR EXTRACTION OF OIL FROM OIL SHALES AND FOR LOW TEMPERATURE CARBONISATION

. 14 .
VICTOR CEMENT CO., LTD.
Glenconner Works, North Hillington, Glasgow, S.W.2
CEMENTS

. 15 .
AMERICAN-BRITISH CHEMICAL SUPPLIES, INC.
180 Madison Avenue, New York
CHEMICALS AND ALLIED PRODUCTS

. 16 .
KAY-FRIES CHEMICALS, INC.
West Haverstraw, New York
FORMALDEHYDE, INTERMEDIATES, PLASTICIZERS, AROMATICS

. 17 .
CHARLES TENNANT & CO. (CANADA), LTD.
137 Wellington Street, West, Toronto 1
DISTRIBUTORS OF CHEMICALS AND ALLIED PRODUCTS

EACH OF THESE COMPANIES TRADES AS A SEPARATE UNIT
The Tennant Group is represented by well introduced agents throughout the World.

American-British Chemical Supplies, Inc.

180 MADISON AVENUE, NEW YORK CITY

Telephone—AShland 4-2265 **Cable Address—Bisulphide, New York City**

MANUFACTURERS — IMPORTERS — EXPORTERS
"SINCE 1797"

Write for a copy of the Tennant Book

sylvania with the exception of greater Philadelphia. Mr. Lillis was formerly connected with the Dixie Cup Company at Easton, Pa.

General Aniline & Film Corp.'s Ansco and Ozalid divisions, Binghamton, N. Y., are planning expenditure of about $2,500,000 for current and postwar construction.

Atlas Powder Co., Wilmington, Del., has appropriated $400,000 for construction of new units at its research laboratory.

National Aniline division of the Allied Chemical & Dye Corp. is planning expenditure of $10,000,000 in a postwar chemical plant construction program. The expanded operations are expected to provide employment for 1,500 workers.

Edward P. Paul & Co., Inc., New York, has announced the re-establishment of its chemical department under the direction of A. E. Ratner.

PERSONNEL

Hercules Names Two Researchers

The Hercules Powder Co. has made two recent appointments to the Hercules Experiment Station. W. Donald Thompson has been named assistant leader of the papermaking chemicals group. He has been a member of the group for the past year and was previously with the United States Rubber Co.

J. Ernest Nachod, Jr., has been appointed assistant leader of the pilot plant group. He has been with Hercules since 1941, before which he spent four years at the du Pont Experiment Station.

Hercules Powder Company's Explosives Department has named William C. Hunt assistant general manager, and Harry V. Chase to succeed him as director of operations.

C. E. Kinney, assistant to the director of operations, Naval Stores Department, who for the past 40 years has been associated with the wood naval stores industry, retired on June 30.

Paul Slawter Rejoins Chemical Industries

Paul Slawter, formerly associate editor of Chemical Industries, has returned as director of research and promotion after a two and a half year absence, during which he served as an officer in the 8th Air Force. Mr. Slawter, whose medals include the Distinguished Flying Cross and the Air Medal with four Oak Leaf Clusters, completed 35 missions.

Penn Salt Makes Research Staff Changes

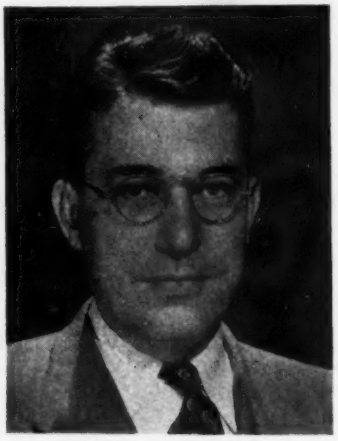
Frank E. Murphy, formerly assistant to manager of research and development department, has been appointed director of development division of the research and development department of the Pennsylvania Salt Manufacturing Co. Mr. Murphy will have charge of chemical engineering activities, including pilot plant operations, engineering research and related fields of work.

The company has announced the following additions in its research and development staff: C. E. Inman, formerly with Hooker Electrochemical Co.; H. S. Fisher of Aluminum Company of America; O. T. Aepli of Attapulgus Clay Company; E. P. Street, recent graduate of Yale University.

Fauser Is Warner President

Erwin F. Fauser, executive vice-president and general manager of William R. Warner & Co., Inc., manufacturing pharmaceutists, New York City, has been elected president of the company, to succeed Marvin R. Thompson, according to G. A. Pfeiffer, chairman of the board.

Scheer on Amecco Board



Walter E. Scheer has been elected vice president and a member of the board of directors of Amecco Chemicals, Inc., Rochester, N. Y. Mr. Scheer has been general manager for the past several years.

Phillips Chemical Appoints New Head

The Phillips Chemical Company has made public the appointment of Meyer Agruss as general manager.

In the industrial field Dr. Agruss was assistant to the plant superintendent of the Titania Pigment Corporation and later in charge of the metallurgical research at the A. O. Smith Corporation in Milwaukee. For the past ten years he has been associate director of research for the Pure Oil Company.

Monsanto Promotes Skehan

Promotion of J. P. Skehan to the position of assistant sales manager for sheet and Vuepak materials at Monsanto Chemical Company's Plastics Division, Springfield, Mass., was announced recently.

He succeeds S. A. Bell, who resigned to enter the service of the Columbia Protektosite Company at Carlstadt, N. J.

General Electric Plastics Promotes Goldblum and Rice

The plastics division of the General Electric Co., has appointed Kenneth B. Goldblum and Roger Rice group leaders in the research laboratory.

Dr. Goldblum, previously group leader of the standards and testing section of the chemical laboratory, will serve as leader in charge of the research and development section. Mr. Rice, who joined the company in 1943, was formerly employed by the War Department as a plastics specialist. He will act as group

Dicalite Appoints Blunt and Crossin

R. W. Blunt, left, has been made manager of the Philadelphia district and E. V. Crossin manager of the Pittsburgh district for the Dicalite Co. Mr. Blunt was formerly with Kieckhefer Container Co., while Mr. Crossin was associated with Columbia Engineering Corp.

leader of the standards and testing section of the laboratory.

Recent additions to the laboratory staff include David J. Morrison and Alex E. Holstein to the resin development group, John W. Wellman to the research and chemical development group, G. Marshall Naul to the laminating development group, and John W. Chapin to the chemical engineering group.

Fiedler Joins Bjorksten Labs

Stuart O. Fiedler has joined the staff of Bjorksten Laboratories as a research associate. His experience includes work for the du Pont company, the Drackett Co. and the Quaker Chemical Products Co.

Du Pont Announces Changes

For reasons of health, Charles M. A. Stine has retired as a member of the Executive Committee of E. I. du Pont de Nemours & Company and as its advisor on research and development. He retains his positions of vice-president and director. Dr. Stine will be succeeded on the Executive Committee by Roger Williams, assistant general manager of the Explosives Department, who has been elected a vice-president and member of the board.

Announcement has been made of the retirement of John L. Keats and the transfer to Fairfield, Conn., of G. T. Vaala, both group leaders at the Experimental Station here in the Chemical Department. R. M. Joyce, B. C. Pratt, and H. S. Young were appointed group leaders.

At the Fabrics Division Fairfield plant Dr. Vaala will be assistant director of the laboratory. D. J. Sullivan, formerly assistant chemical superintendent has been named assistant plant manager.

Goodrich Appoints Two

Two appointments on the research staff of The B. F. Goodrich Company have been made known by Dr. Howard E. Fritz, director of research.

Dr. T. L. Gresham has been named director of organic chemicals research. He has been director of Koroseal and plastic research since 1943. Dr. C. F. Gibbs has been appointed director of polymerization research.

Personnel Notes

P. H. MESSINGER has accepted a position as a member of the technical staff of Henry Bower Chemical Manufacturing Co. He was previously employed by the General Chemical Company as plant superintendent of the Baker and Adamson works at Marcus Hook.

WILLIAM W. AUSTIN, JR., recently in charge of Physical and Chemical Testing Laboratories for Consolidated Vultee Aircraft Corporation, Nashville, Tennessee, has accepted a position as research metallurgist on the staff of Southern Research Institute.

HAROLD HEDSTROM has resigned from Berg, Hedstrom & Co., Inc., as vice-president and treasurer and has been appointed executive vice-president and general manager of Nord International Corp., exporters and importers, New York.

FRED MUELLER and W. D. BRAIDWOOD, Corn Products Refining Co., have been elected to the posts of vice-president and director respectively.

Aromatic Chemicals

IN INDUSTRY

THE field of Aromatic Chemicals in Industry has widened considerably in recent years.

NO longer is the use of Perfumes restricted to the Soap, Cosmetic and Perfume Manufacturer.

PERFUMES are now widely used by such diverse manufacturers as: the rubber industry, the paper industry, the textile industry and many others.

FURTHER research is constantly being made both by us and by manufacturers of many diverse products.

PERHAPS we can be of service to you.

Among our many products the following are proving useful in numerous industries:

Butyl Phenyl Acetate	**Cinnamic Alcohol**
Lignin Vanillin	**Ionone Ketone**
Veratraldehyde	**Ionone Methyl**
Ethaldehyde	**Acetophenone**

Phenyl Acet Aldehyde Di Methyl Acetal
Di Phenyl Acetal of Phenyl Acet Aldehyde
Hydratropic Aldehyde
Para Methyl Hydratropic Aldehyde

To deodorize Paints for Interior Finishes
DEODORANT BOUQUET 4068

Write us for Information

Aromatics Division
GENERAL DRUG COMPANY
125 BARCLAY STREET NEW YORK 7, N. Y.
9 S. Clinton Street, Chicago 6 1019 Elliott Street, W., Windsor, Ont.

Between the Lines

(*Continued from page 280*)

dyes, having learned to use these products successfully, were hesitant in risking the use of other dyes. By 1928, 16.6 percent of the value of all German exports of alizarine dyes, 18.3 percent of the value of German chemical fertilizers exported, and 26.3 percent of such exports of synthetic ammonium sulfate, were for reparations. It may be significant that in that year, when Germany had an option to end its deliveries of chemicals for such account, the Agent General for Reparations was informed by German authorities that they were quite ready to continue this form of reparations payment.

The Agent General, far from seeing anything amiss, stated that year that the Allied reparations authorities considered it advisable to encourage deliveries in goods because of their healthy effect on German industrial activity.

Here, then, is the line of departure on current future policy toward German industry. It appears that no war-making capacity whatever is to be allowed. Evidently German industrialists did not grasp this changed attitude at once.

The reports of the returning technicians, and the statements of American officials at home on the subject, are full of references to the "tactics of the German industrialists."

Military government men, so run the reports, are met at each factory by obviously hand-picked Germans, frequently engineers, English-speaking, and in many instances, waving credentials to show their connections or acquaintanceship abroad, especially in the United States. They are anti-Nazi in their professions to the visiting American or other Allied officials, and what they want to sell is the idea that this vast German potential can now be geared to help lick Japan, or anyway to meet the distress in liberated Europe due to lack of every essential.

There is considerable emphasis, heard in Washington, on the subject of the relationship of international cartels to possible German rearmament. The various ramifications believed in Washington to be involved under this heading are now being explored.

As to the ultimate solution, Dr. Morgan is understood to be preparing certain recommendations with respect to Germany's chemical industrial potential. Doubtless these, and other suggestions will fit into the execution of the policy now shaping, which was summed up in the statement by Foreign Economic Administrator Leo T. Crowley, "If we now mean to prevent Germany from possessing the means of waging a Third World War, we must disarm her economically and industrially, as well as militarily."

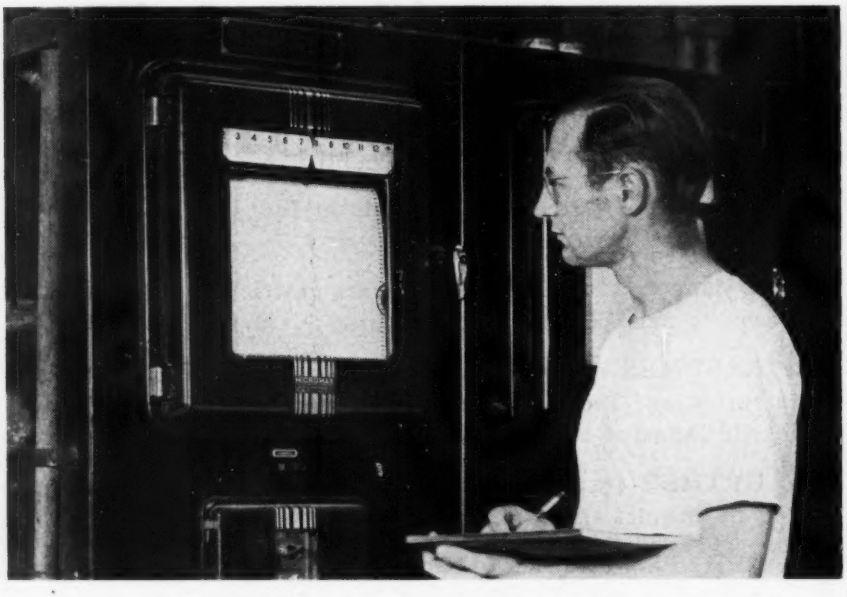
Assistant Attorney General Wendell Berge said this:

"The disposition of the enormous physical plant and capacity comprising German industry represents an intricate problem in itself. It would be shortsighted, to say the least, if the Allies were to permit the continued existence of plants and machinery devoted directly to the production of German armaments and munitions."

How the policy will be carried out is still in the discussion stage.

The Technical Industrial Disarmament Committee on the treatment of German chemical industry includes, besides the chairman and acting chairman, John W. Barnet, mineral specialist, State Department; Lieut. Comdr. R. B. Colgate, chief of Chemicals Section, Navy Department; C. C. Concannon, chief of Chemical Unit, Department of Commerce; J. Forsyth Glenn, counsel, Chemicals Bureau, WPB; Thomas S. Nichols, WPB; Oliver Ralston, assistant chief of Metallurgical Branch, Interior Department; and Lieut. Col. W. F. Sterling, chief of Commodities Branch, Production Division of ASF, War epartment; Martin T. Bennett, chief of Industry Division, Foreign Economic Administration.

JOHN M. LEACH, vice-president and house counsel, and RALPH W. HENDERSON, vice-president and general plant manager, have been elected directors of William R. Warner & Co.



Micromax pH Controllers, feedwater plant, Wyandotte Chemicals, Inc., Wyandotte, Mich.

WYANDOTTE PLANT HOLDS pH TO ±0.2 WITH MICROMAX RECORDING CONTROLLER

Raw water at Wyandotte Chemicals, Inc. is treated with a lime soda softening and a phosphate softening, then deaerated and filtered. To reduce the pH from 10.1, after filtration, to 7.9, sulfuric acid is added by means of the Micromax Electric Controller. Micromax control on this step results in finished water within ±0.2 of the ideal. Valuable man hours are saved — waste of acid is eliminated. The continuous graphical record of the Micromax Controller is read quickly and accurately by any workman.

Further details of L&N Micromax Recording Controllers are available in Catalog N-96(1), sent on request.

Ind Ad N-96-701(4b)

LEEDS & NORTHRUP COMPANY, 4982 STENTON AVE., PHILA., PA.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

War Affects Coatings

(*Continued from page 259*)

short from time to time. Rosin-modified phenolic resins, very much in use with softer oils, were not available for civilian purposes and were also hard to get for many high-priority uses. Maleic resins were originally more available than phenolic resins, but the shortage of maleic anhydride soon put this type of resin on the critical list also. Ester gum was the only available standard varnish resin for quite some time until recently the rosin shortage curtailed the allocation of all rosin-containing resins for civilian purposes. Rosin-modified phenolics, rosin-modified maleics, ester gum and the pentaerythritol esters were all included in the critical list.

The manufacture of pentaerythritol for explosive purposes caused large stocks to be built up, and some of this has been made available on allocation to resin manufacturers. This was the main reason why the lack of other hard resins has been still endurable. The pentaerythritol resin esters yield fast-bodying and good drying varnishes with linseed oil and dehydrated castor oil. Right now these resins are also short, but improvement is hoped for.

Terpene resins, developed during the war years, are also good varnish materials. They do not contain rosin, but lack of manufacturing facilities and raw materials does not permit these resins to counteract to any great extent the shortage of rosin-containing resins. The terpene resins yield varnishes with good drying and good color-retention properties. They do not body well with oils in the varnish kettle and special methods have to be applied in their use. Styrene resins for the varnish trade have also been put on the market during the war years, and their use in the future might well gain importance.

Among the natural resins, congo was the only one which was available. In the later period shortages of this resin also developed.

Most pigments have been hard to obtain all the time. Scarcity developed particularly in chromium and titanium pigments. Pigment substitution was one of the greatest headaches of formulators since all shades had to be reformulated when one basic pigment ingredient had to be changed. This is very painstaking work, and much credit is owing to the formulators.

FUTURE OUTLOOK

The tremendous increase in phthalic anhydride production capacity automatically promises increased popularity of alkyd resins in the postwar period. Developments in the vinyl resin field will have important effects in the future. The recent development of high-solids vinyl resin emulsions will greatly facilitate the use of these coatings. Vinyl coatings were earlier handicapped by the low solubility of vinyl resins and their need for special high-cost solvents.

Pentaerythritol esters, both rosin-containing and fatty acid-containing, have a promising future, and the prediction could be ventured that pentaerythritol esters will grow in importance as soon as raw material shortages disappear. Sorbitol esters of fatty acids will also gain in importance.

The terpene resins and other hydrocarbon resins, like the oil-soluble styrene resins, appear promising. As soon as production capacity can be adjusted to demand, their popularity will increase. New oil and resin-soluble styrene resins may be developed in the future.

Urea-formaldehyde and melamine-formaldehyde resins of the organic solvent-soluble type will gain in importance as soon as the alkyd resins, which are the most useful known plasticizers, become freer. Water-soluble urea-formaldehyde and melamine-formaldehyde resins have gained importance recently in paper coating finishing and in the manufacture of wet-strength papers. Also in textile finishing are urea and melamine resins finding increasing usefulness.

In the drying-oil field, synthetic esters and organic agent-modified oils and esters will grow in sales. Many new methods have been developed which will increase the drying velocity of drying oils and improve their other characteristics.

In lacquers many of the new plasticizers are here to stay, even though many of the older, now critical plasticizers regain their former popularity. Sebacic acid derivatives are examples.

The shortage in solvents has been one of the factors which has drawn attention to the high-solids lacquers, which are applied from more concentrated solutions, the necessary low viscosity being obtained by elevated temperatures instead of by solvent addition.

Chlorinated paraffins have gained importance primarily because chlorinated rubbers have not been available. Their uses, however, have become so important and manifold that they will remain one of the materials from which postwar manufacturers will formulate protective coatings.

One of the important effects of wartime requirements has been the increased interest in coating material emulsions. Valuable new experience has been gained, new emulsifying agents, new emulsifying techniques and equipment have been devised, and it is fully expected that coating material emulsions will gain in prominence.

The writer wishes to express his thanks for the courtesy of the following companies in supplying material for the illustrations in this paper: Bakelite Corporation, Dade Bros., Inc., Industrial Tape Corporation, and N. J. Zinc Company.

WOOD TREATING CHEMICALS COMPANY

WOOD TOX

Manufacturers and Distributors of Toxic and Water Repellent Solutions for the Control of . . .

TIMBER TOX

DECAY • BLUE STAIN • TERMITES • SWELLING • WARPING CHECKING • SHRINKING MOISTURE ABSORPTION Molds • Powder Post Beetles Grain Raising

WOOD TREAT

TIMBER TREAT

WOOD FIX

GOVERNMENT REQUIREMENTS

All Army and Navy Specifications calling for chlorinated phenol wood preservatives, moisture repellents and coloring.

TERRA TOX

WOODTOX, WOODTREAT, WOODFIX, TIMBERTOX, TIMBERTREAT, TERRATOX

Sales Agents for Monsanto Chemical Co. — Santophen 20, Santobrite and Permasans

WOOD TREATING CHEMICALS COMPANY

General Offices and Plant:

5137 SOUTHWEST AVE. ST. LOUIS 10, MO.

CHEMICAL SPECIALTIES NEWS

Pittsburgh Plate Buys C. A. Michel Company

Pittsburgh Plate Glass Company has completed purchase plans for the C. A. Michel Company, distributors of paint in the Pittsburgh district for 99 years.

The glass company plans to abandon its present store room in Duquesne Way, Pittsburgh. Sales activities will be carried on at the two Michel stores, one in downtown Pittsburgh and the other on the city's Northside, and at the Michel warehouse.

Pittsburgh Plate officials said the acquisition was part of the company's plans for increased paint distribution following erection of a new paint factory at Springdale, Pa.

Armstrong Rubber Plans Research Laboratory

The Armstrong Rubber Co., West Haven, Conn., is planning to establish a completely modern physical and chemical laboratory as soon as essential materials are available. Activities of the laboratory will be concerned chiefly with the development of better tires and other related products, and the scope of work will include investigations into raw materials, chemicals, compounding, construction and design. The site of the laboratory has not yet been determined.

General Printing Ink and A. C. Horn Talk Merger

The A. C. Horn Co., manufacturers of paint and varnish, lacquers, and waterproofing compounds, and the General Printing Ink Corporation are negotiating a merger. No details are available at present.

McKesson & Robbins Promotes Kienzle

Fred B. Kienzle has been appointed chief executive of the Kirk-Geary division of McKesson & Robbins, Inc., Sacramento, Calif., according to an announcement by William J. Murray, Jr., president. He succeeds T. J. Turnbull, who is retiring.

Bryant Chemical Purchases Plant

Joseph A. Bryant, Jr., president of Bryant Chemical Corporation, has announced that agreement has been made for the purchase as of May 31, 1945, of the assets of the chemical and mill supply division of the Textile Service & Chemical Corporation, North Quincy, Massachusetts. The Bryant Chemical Corporation will operate the plant and laboratory located at 6 North Street, North Quincy, for the manufacture of textile chemical specialties sold under the trademark Brytex Products.

Paisley Improves Chicago Plant

As a further step in a long range postwar planning program, Paisley Products, Inc., Chicago, is enlarging and modernizing its four-story and basement factory at 1770 Canalport Ave.

According to Mr. Murray Stempel, vice president and general manager, the expansion of facilities was necessitated by greatly increased demands for adhesives.

Smith Named to Johnson & Johnson Board

Dr. David F. Smith, director of research of Johnson and Johnson, New Brunswick, N. J., has been elected to the board of directors of that company. Dr. Smith, a gradute of the California Institute of Technology, joined Johnson and Johnson in April, 1942. Following his graduation from California Tech., he was for three years research associate at the University of California under a grant from the National Research Council.

I. M. & C. to Build Two Fertilizer Plants

Plans for the construction of two fertilizer plants by International Minerals and Chemical Corporation have been announced by Louis Ware, president of the corporation.

A new $100,000 plant will be built in Mason City, Iowa, and a $200,000 plant will be erected in Hartsville, S. C., to replace a plant owned by the corporation there which was destroyed by fire in December. Both will be completely modern throughout, and equipped with all the latest labor-saving machinery.

The Mason City plant will produce a complete line of mixed fertilizers for corn, alfalfa, small grains, clover and truck crops, while the new plant at Hartsville, larger than the original, will produce mixed fertilizers and manufacture superphosphate.

Construction on both plants will begin soon and they are expected to be in operation in time for the spring shipping season in 1946.

APMA Elects 21 Firms

Twenty-one firms have been elected to membership in the American Pharmaceutical Manufacturers Association since last June, it was disclosed in a report by the chairman of the organization's membership committee, J. L. Rogers of Pitman Moore Co., Indianapolis. Joseph Huisking of Fritzsche Bros., Inc., New York, is vice chairman of the committee.

The firms elected to active membership follow: The William S. Merrell Co.; Crystogen Chemical Co., Inc.; A. E. Mallard Laboratories, Lederle Laboratories, Inc.; E. S. Miller Laboratories, Inc.; Ortho Products, Inc.; A. H. Robins Co., Inc.; Winthrop Chemical Co., Inc.; Cheplin Laboratories, Inc.; Meta Cine Co., Inc.; Smith, Kline & French Laboratories, and Harris Laboratories.

Those elected to associate membership include: Anheuser-Bush, Inc.; the Bordon Vitamin Co.; I. P. Sallison & Sons Co.; Chas. H. Dietz, Inc.; Aluminum Seal Co.; Barrett Division, Allied Chemical & Dye Corp.; Distillation Products, Inc., Kiernan-Hughes Co.; and Chas. Bowman & Co.

Langdale to Erect Gum Distillation Plant

A gum distillation plant costing approximately $75,000 will be erected in Valdosta, Ga., by the Langdale Naval Stores Company.

Quaker Chemical Names Gans

The appointment of Dr. David M. Gans as technical director has been announced by Quaker Chemical Products Corporation, Conshohocken, Pa., developers and manufacturers of chemical specialties for the metal working and textile processing and finishing industries. Dr. Gans has already entered upon his duties, which include the supervision of Quaker's research, service and control laboratories.

Dr. Gans received his Ph.D. degree from the University of Chicago in 1929 and remained with that institution in the

Church & Dwight Co., Inc.

Established 1846

70 PINE STREET NEW YORK

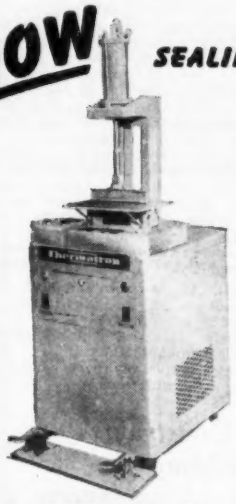
Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

Standard Quality

NOW **SEALING-WELDING-BONDING**



The **THERMATRON** "Weldmaster" with demonstration heat-weld equipment.

MORE PROVED USES FOR THE

Thermatron

ELECTRONIC DIELECTRIC HEAT GENERATOR

Electronic welding of thermoplastic sheeting such as Koroseal, Vinylite and Saran, which has been proved practical and time-saving by months of production on **THERMATRON** units in a war industry, opens a new field for postwar activities.

The list of everyday products which lend themselves to the **THERMATRON** method is endless. It includes such items as shower curtains, bathing caps, aprons, cosmetic bags, tobacco pouches, tennis racket covers, etc.—in fact, almost any product fabricated of thermoplastic sheeting which has hitherto been stitched or sealed by resistance heating. **THERMATRON** can handle the assignment—and make faster and cheaper "seals" or "welds."

Almost any seamed product of thermoplastic sheeting can be fabricated better and quicker with **THERMATRON** equipment.

• • •

THERMATRON electronic dielectric welders are available in 1 KW, 2½ KW and 5 KW sizes. Send for folder, "Heat Sealing of Plastics by Electronics."

THE THERMATRON LINE

. . . of electronic dielectric heat generators, 500 watts to 30 kilowatts, for all purposes, including the popular 5 KW "Heatmaster" especially designed for heating preforms, is described in our **THERMATRON** folder. Free on request.

No THERMATRON has ever become an orphan. THERMATRON application service insures against it.

Thermatron *ratings based on output*

RADIO RECEPTOR COMPANY, Inc.

331 WEST 15th STREET NEW YORK 11, N. Y.

Quality Chemicals for over 50 years

PHELPS DODGE REFINING CORPORATION

NICHOLS

TRIANGLE BRAND

REG. U. S. PAT. OFF.

CHEMICALS

40 WALL ST. NEW YORK

COPPER SULPHATE

NICKEL SULPHATE

COPPER OXIDE

Department of Chemistry until 1935, at the same time engaging in chemical consulting work. In the fall of 1935 he joined the Interchemical Corporation, being associated first with the United Color and Pigment Division and later with the corporation's Central Research Laboratories where he served as Assistant Director of Research from 1939 until resigning to join Quaker Chemical Products Corporation on May 1st of this year.

The need of Quaker's research laboratory for additional space has recently necessitated the erection of a new wing on the laboratory building and the removal of the laboratory's library to a newly acquired adjacent property which has been remodeled to house the library and to provide meeting rooms.

Purocaine Announces Purchase

Purocaine, Inc., has announced to its suppliers that it has purchased the assets of Purocaine Chemical Company, Inc., 9-20 Thirty-eighth Avenue, Long Island City, New York.

Its manufacturing operations will be continued as heretofore at the plant in Long Island City, and its sales division and purchasing office is located at 90 West Street, New York 6, N. Y.

Du Pont's DDT Called "Deenate"

The du Pont Company has announced that the trade mark for its agricultural insecticide containing DDT is "Deenate," and that compounds containing the powerful war-developed pest control product will be ready for fruit and vegetable growers as soon as reduction of military demands will permit. DDT output is now confined to experimental and military uses.

The announcement pointed out that DDT in pure form is not efficient as an insecticide. It has to be combined with proper carriers for the particular job to be done.

Du Pont, major producer of DDT, has been making various DDT compositions for the armed forces. "Deenate" compositions for use on agricultural crops have been evolved from research in the laboratory and the field and are specialized formulations for specific pest control problems.

Thompson Forms Three Companies

Dr. Marvin R. Thompson, whose resignation as president of William R. Warner & Co., Inc., and director of the Warner Institute for Therapeutic Research became effective July 1st, announced plans for the formation of three separate operating companies: Marvin R. Thompson will manufacture and distribute the MRT brand of ethically promoted pharmaceutical specialties, Paul Thompson Associates, the P-T-A brand of consumer-promoted pharmaceutical and toilet accessories, and M-R-T, Inc., will develop modern research trends in cosmetics.

The offices, laboratories and manufacturing facilities are located at 67 Greenwich Avenue, Stamford, Connecticut.

Soil Tester

For many years it has been known that the electrical conductivity of soil extracts accurately indicates the soluble salt or fertilizer content of the soil. In the past, however, the necessary equipment has been elaborate and delicate, and not adapted to the needs of the greenhouse.

Now for the first time, a compact, sturdy, low-cost, easy-to-operate instrument, the Solu-Bridge Soil Tester, is available, built specifically for soil workers.

The Solu-Bridge Soil Tester is a self-contained A.C. Wheatstone bridge employing a cathode-ray "eye" tube to indicate the point of balance, and operating directly from the 115 V., 60 cycle power line. A temperature compensator is incorporated to eliminate the need for computation. The range of the instrument is from 10 to 1000 mhos x 10^{-5} specific conductance, corrected to 25° C.

To make a measurement, a sample of air-dry soil is mixed with twice its weight of soft water, shaken for a minute or two, and the coarse particles allowed to settle for a few minutes. The solution is then poured into a clean vessel, its temperature checked with a thermometer, and the temperature compensator is set to that value. The conductivity cell is dipped into the extract and the main dial turned until the "eye" shows balance, whereupon the specific conductance is read directly from the scale. No calculations whatever are necessary.

Descriptive literature on the Solu-Bridge Soil Tester is available from the manufacturer.

Farmers' Exchange Buys York Chemical Works

The Eastern States Farmers' Exchange has purchased, effective June 15, the land, buildings, and inventories of the York Chemical Works, York, Pa. It is planned to continue operation of the plant under the present staff, headed by Owen H. Shaffer. For the time being the output will be available first to customers of the York Chemical Works. Eastern States operates two other plants at North Cambridge, Mass., and Wilmington, Del.

Definition of Terms for DDT

(Adopted by DDT Committee, Manufacturing Chemists' Association of the U. S., July 10, 1945.)

1. The contraction DDT was first suggested by officials of the British Ministry of Supply early in 1943. This abbreviation was later adopted by agencies of the American Government for that class of chemical compounds known generically as Dichloro-diphenyl-trichloroethane.

2. DDT currently produced for and procured by the Military under government specifications
JCQD 1005A (December 29, 1944)
JAN-D-56 (June 30, 1944)
Bureau of Ships 51-1-12 INT (May 15, 1944)
is the product obtained when one molecule of chloral and two molecules monochlorobenzene react with each other in the presence of concentrated sulfuric acid. This reaction mixture consists essentially of 2,2 bis-(p-chlorophenyl) 1,1,1-trichloroethane, lesser amounts of other isomers, and by-products of reaction. If the product resulting from any other process is identical, the use of raw materials other than chloral and monochlorobenzene for the production of DDT in no way would affect or change the nature and character of these definitions and terms.

The melting point of this isomer mixture is not sharply defined, and in line with the usual practice in dealing with such products, the above specifications have assigned a "setting point" value of 88°C. minimum and designate the product as "DDT (dichloro-diphenyl-trichloroethane) Technical." Therefore, this product is best described as:
DDT (dichloro-diphenyl-trichloroethane)—
Technical
(Setting Point 88°C. minimum)

3. Other refined or purified grades may be required for specific purposes. For example, JCQD 105A (December 29, 1944) provides for a purified DDT possessing a "melting point of 103°C. minimum." This quality grade can best be described as:
DDT (dichloro-diphenyl-trichloroethane)—
Purified
(Melting Point 103°C. minimum)

4. Future developments may require a more highly purified DDT with respect to a higher content of the para para isomer, or even require some one specific pure isomer. In such an event, sufficient descriptive designations are already in established use in the fine chemical industry to adequately describe the quality, if specifications therefor promulgate—i. e., U.S.P., C.P., Reagent. Eventual designation of such quality products is best described by the generic chemical name dichloro-diphenyl-trichloroethane as the main title, followed by the chemical name for the specific isomer as a subtitle in parenthesis. For example:
Dichloro-diphenyl-trichloroethane-Reagent
(2,2 bis-(p-chlorophenyl) 1,1,1-trichloroethane)

5. Formulations: It is recommended that when DDT is shown as an ingredient, the statement be worded as follows:
Active Ingredient DDT (dichloro-diphenyl-trichloroethane)—Technical ..... xx%
Other ingredients, active or inert, should be shown as required by regulations.

Winthrop Constructs Ampul Building

Construction of a new $500,000 windowless ampul building for the Winthrop Chemical Company, Inc., featuring blowers in the entrance lobby for the "dedusting" of all employees and visitors, is under way at Rensselaer, N. Y., according to Dr. Theodore G. Klumpp, president. He announced at New York City headquarters that completion is scheduled for this fall.

It will be the first unit in a post-war expansion program for Winthrop, which became a wholly-owned subsidiary of Sterling Drug, Inc., on April 23, Dr. Klumpp said. Property is available for the addi-

GUMS Chemicals and Oils
(CRUDE, POWDERED)

REPRESENTATIVES:

CHICAGO:
CLARENCE MORGAN, INC.

BOSTON:
P. A. HOUGHTON, INC.

PHILADELPHIA:
R. PELTZ & CO.

ST. LOUIS:
H. A. BAUMSTARK & CO.

GUMS:

GUM ARABIC — GUM TRAGACANTH
GUM ARABIC BLEACHED — GUM EGYPTIAN
GUM GHATTI — GUM LOCUST (Carob Flour)
GUM KARAYA (Indian) — QUINCE SEED

SPECIALTIES:

MENTHOL (Crystals) — CREAM OF TARTAR
PEPPERMINT OIL — GLUCOSE (U.S.P.)
TARTARIC ACID — COUMARIN

EGG ALBUMEN — JAPAN WAX (Special)
EGG YOLK — CANDELILLA WAX
BLOOD ALBUMEN — CASEIN

PAUL A. DUNKEL & CO., Inc.
1 WALL STREET
NEW YORK 5, N.Y.
Hanover 2-3750

IMPORTERS AND EXPORTERS

CHICAGO: 919 N. MICHIGAN AVE., TEL. SUP. 2462

R.W. Greeff & Co. Inc. — RWG — New York, U.S.A.

INDUSTRIAL AND PHARMACEUTICAL Chemicals

TRICRESYL PHOSPHATE

•

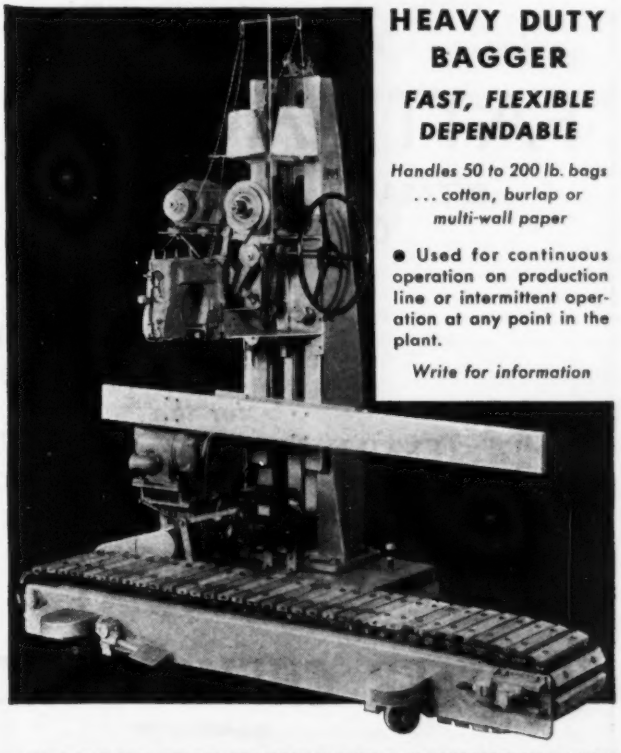
Subject to allocation by the War Production Board in accordance with Order M-300, Schedule 61.

Selling Agents for
Montrose Chemical Company
Lister Avenue, Newark, N. J.

R.W. GREEFF & CO.

10 ROCKEFELLER PLAZA — NEW YORK CITY
TRIBUNE TOWER — CHICAGO, ILL.

The CONSOLIDATED Model 105



HEAVY DUTY BAGGER

FAST, FLEXIBLE DEPENDABLE

Handles 50 to 200 lb. bags . . . cotton, burlap or multi-wall paper

● Used for continuous operation on production line or intermittent operation at any point in the plant.

Write for information

CONSOLIDATED PACKAGING MACHINERY CORP.
BUFFALO 13, N.Y.

tion of a million square feet of plant space if and when needed.

Light for the windowless building will be provided by panels of glass brick.

Ultraviolet lamps are to be installed in the air-conditioning ducts leading to all production departments to insure the delivery of germ-proof air. Glazed tile walls and double-glazed partitions, designed without moldings or ledges; a suspended ceiling with recessed fluorescent lighting fixtures; and concealed piping and mechanical equipment will expedite the maintenance of dust-free conditions at all times, according to Austin engineers.

Allison Joins Waldrich

Robert C. Allison, formerly chief chemist for Alexander Smith & Sons Carpet Company and for the past few years in charge of their chemical research, has left that organization to become affiliated with the Waldrich Company.

Mr. Allison will work directly under Oscar R. Flynn, who has been head chemist of the Waldrich Company for many years.

Standardization Sought For Rayon and Shellac

International standardization of shellac specifications is sought by the United Nations Standard Committee, and the American Standards Association will appoint a committee, under supervision of the American Society for Testing Materials, to develop the American point of view to be presented for international consideration. Standards already in use, such as those of the U. S. Shellac Importers Association and the American Bleached Shellac Manufacturers Association, will be studied.

Also the New York Board of Trade has suggested international agreement on the meaning of the term "rayon." In this country it is limited to textile fiber or yarn produced from cellulose or with a cellulose base. In England, however, the term is applied generally to a wide range of synthetics, including nylon and glass fibers.

Insecticide Industry Personnel Changes

W. W. THOMAS, who has been Eastern district manager for California Spray Chemical Co., has been named general sales manager. Mr. Thomas is succeeded at the Elizabeth, N. J., Eastern office by RUSSELL DORMAN, who has been stationed there is charge of research. Mr. Dorman is succeeded by WALTER REED.

FRIAR THOMPSON, JR., who has been a research entomologist for Hercules Powder Co., at Wilmington, Del., has become manager for the insecticide division of R. J. Prentiss & Co., New York. He is succeeded at Hercules by FRANK V. RAPP.

F. H. POUGH, who has been general manager of the sulfur department of Southern Acid & Sulphur Co., Inc., St. Louis, Mo., has retired. He is succeeded by G. W. SNEED, his former assistant.

Tropical Disease Research

Plans for further field research in tropical diseases by American scientists cooperating with the Royal Egyptian Government were discussed in Albany and Rensselaer, N. Y., during a visit to the laboratories of the Winthrop Chemical Co., Inc., by His Excellency Dr. A. M. Kamel Bey, Director General of Preventive Diseases of the Egyptian Ministry of Health.

Dr. Kamel arrived in this country two months ago as a technical advisor to the Egyptian delegation to the United Nations Conference. In New York City he visited Memorial Hospital and the Cornell University Medical Center. While in Rensselaer His Excellency inspected Winthrop's research laboratories and plant where research is being undertaken on a number of preparations for treatment of tropical diseases.

Last January Dr. Maurice L. Tainter, Winthrop's director of research, and Dr. Chester M. Suter, director of chemical research, visited Egypt and other Near East countries. Then they set in motion collaborative efforts with Egyptian scientists, including Dr. Kamel, looking toward development of clinical and laboratory facilities for long range studies of malaria, schistosomiasis (a liver infestation), bilharzia disease, and trachoma.

CHEMICAL KESSCO PRODUCTS SPECIALTIES

TRIACETIN

PLASTICIZER and SOFTENER
for
CELLULOSE ACETATE
and
SYNTHETIC RESINS

FATTY ACID ESTERS

STEARATES,
OLEATES,
LAURATES,
PALMITATES,
RICINOLEATES,
OTHERS,

for the
TEXTILE, LEATHER, PETROLEUM,
PLASTIC and ALLIED INDUSTRIES

For Samples, Specifications
Write to

KESSLER CHEMICAL CO., INC.
Established 1921
STATE ROAD and COTTMAN AVE. PHILADELPHIA 35, PA.

TWO PRACTICAL Non-Phthalic RESINS!

you'll find them fine all-purpose enamel liquids for BRUSH, SPRAY or DIP application

Well suited for all indoor applications and for outdoor use where exposure is not severe, these U.S.I. resins afford successful alternates for phthalic alkyds (except for use with basic pigments).

S&W AROPLAZ 1125, is recommended as an all-purpose brushing-enamel liquid, especially suitable for whites. Slower drying than "1127", it has better color retention.

S&W AROPLAZ 1127 is a NEW resin similar to "1125", but with faster drying rate, better gloss retention, and higher resistance to water. It is recommended for spraying or dipping enamels (air-dry or bake) to be used on machinery, venetian blinds, etc.

These resins are more available than Phthalic alkyds, although uses are still limited to an extent (Allocation Order M-300, Schedule 103).

SPECIFICATIONS

	S&W Aroplaz 1125	S&W Aroplaz 1127
Solids	50% in MS	50% in VM&P Naphtha
Solution Viscosity (G-H)	R-T	Q-R
" Color (G-H)	9-11	9-11
" Wt./gallon @ 25C	7.5 lbs.	7.4 lbs.
Plastic Acid No.	22-28	22-30

Samples and additional data available upon request

60 E. 42nd St., New York 17, N.Y.
Branches in all principal cities

U. S. INDUSTRIAL CHEMICALS, INC.

RESINS (Natural and Synthetic), CHEMICALS, SOLVENTS

Dependable!

HUNT'S POTASSIUM FERRICYANIDE

Yes, you can depend on Hunt's Potassium Ferricyanide to produce sharper lines, stronger contrasts and greater accuracy in making blue prints. And all this adds up to greater economy because the fine quality of Hunt's Potassium Ferricyanide enables you to get more duplicates from a single master drawing.

MANUFACTURED BY

HUNT CHEMICAL WORKS, INC.

271 RUSSELL STREET, BROOKLYN, N. Y.

Pharmaceuticals
Synthetic, Organic
Insecticides and Germicides
Research Chemicals

ACETYLTANNIC ACID, U. S. P. (chemical name for Tannigen)

ALBUMIN TANNATE, U. S. P. (chemical name for Tannalbin)

ANTIPYRINE SALICYLATE, N. N. R.

BETA NAPHTHYL BENZOATE, N. N. R.

CALCIUM BENZYL PHTHALATE, pure

BENZYL DISULFIDE

CALCIUM IODOBEHENATE, U. S. P.

CALCIUM LEVULINATE, pure

CAMPHOSULFONATES

CAMPHORIC ACID, C. P.

ETHYL CHAULMOOGRATE, U. S. P.

HELMITOL, N. N. R.

HEXAMETHYL — DIAMINO-ISOPROPANOL-DI-IODIDE Quaternary Ammonium Compound (chemical name for Endoiodin and Iodisan)

• • • •

THYMOLPHTHALEIN

O-CRESOLPHTHALEIN

PHENOLSULPHONPHTHALEIN

Ask for our Complete List of Chemicals

FINE ORGANICS
Incorporated

• • • • MANUFACTURING CHEMISTS

Executive Offices:

211 East 19th Street Gramercy 5-1030 New York 3, N. Y.

BUY MORE WAR BONDS

Cowles DETERGENT SILICATES

DRYMET*
(Sodium Metasilicate—Anhydrous)
GRANULAR OR FINES

CRYSTAMET*
(Sodium Metasilicate—Pentahydrate)
REGULAR GRIND

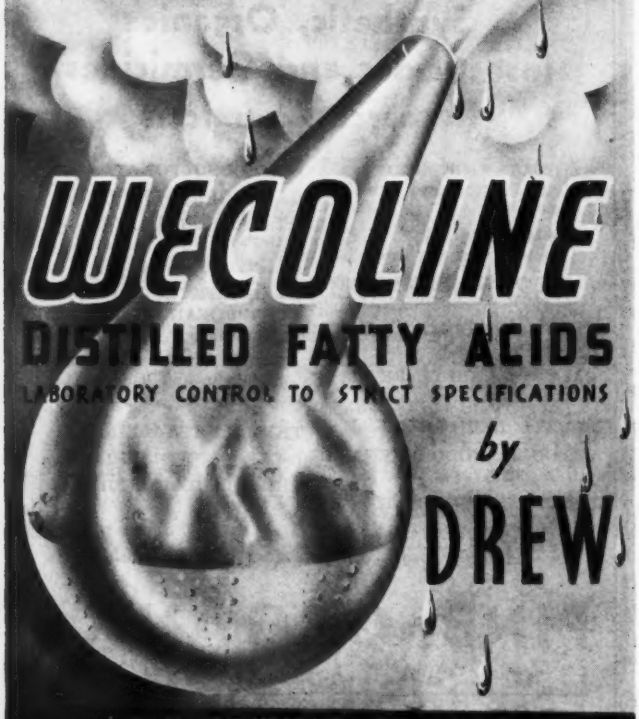
DRYORTH*
(Sodium Orthosilicate—Technically Anhydrous)
REGULAR GRIND DUSTLESS

DRYSEQ*
(Sodium Sesquisilicate—Technically Anhydrous Equivalent)
REGULAR GRIND DUSTLESS

* Reg. U. S. Pat. Off.

THE COWLES DETERGENT CO.
7016 EUCLID AVENUE • CLEVELAND 3, OHIO

BRILLIANCE



WECOLINE
DISTILLED FATTY ACIDS
LABORATORY CONTROL TO STRICT SPECIFICATIONS
by
DREW

E. F. DREW & CO., INC.
Palmolive Bldg., Chicago 11 Chamber of Commerce, Boston 10

Busy Executives
read
CHEMICAL INDUSTRIES

Always at their finger tips, CHEMICAL INDUSTRIES is a dependable source of information. New chemicals, new uses, chemical reports and trends are but a few of the topics authoritatively discussed.

Every executive in the chemical industry will profit by a personal subscription. Prices are $4.00 a year; $6.00 for two years.

BLL

SAPONIN Lemke from yucca plant*

•

* Before the war Saponin was almost exclusively imported or made from foreign materials, but with imports considerably curtailed, most users have turned to Saponin made from the domestic yucca plant abundant in the Western desert regions.

With quality and uniformity much improved over the past few years, large users and resellers specify LEMKE SAPONIN for satisfactory results as well as low cost.

•

Prices and further information on request.

B. L. LEMKE & COMPANY

Fine and Rare Chemicals • Pharmaceuticals • Organic Specialties

248-250 WEST BROADWAY, NEW YORK 13, N. Y.

Telephone: WAlker 5-9870 Cable Address: LEMCRTEX, All Codes

Warehouses: 2-6-8 BEACH STREET, N. Y. C.

NEVILLE

TOLLAC
NEVSOL

These solvents have helped to relieve the critical lacquer diluent shortage during the war

Because of their high nitrocellulose tolerance and excellent evaporation qualities these solvents have enabled many lacquer and other manufacturers to keep their plants operating when they couldn't obtain toluol. They are currently available as Class A Solvents under WPB Conservation Order M-150.

★ *Postwar grades of Tollac and Nevsol, having much higher solvency and nitrocellulose tolerance, will be available as soon as solvent restrictions are lifted. Keep them in mind for your postwar finishes.*

THE NEVILLE COMPANY

PITTSBURGH · PA.

Chemicals for the Nation's Vital Industries

A18

BENZOL · TOLUOL · XYLOL · TOLLAC · NEVSOL · CRUDE COAL-TAR SOLVENTS
HI-FLASH SOLVENTS · COUMARONE-INDENE RESINS · PHENOTHIAZINE · TAR PAINTS
RUBBER COMPOUNDING MATERIALS · WIRE ENAMEL THINNERS · DIBUTYL PHTHALATE
RECLAIMING, PLASTICIZING, NEUTRAL, CREOSOTE, AND SHINGLE STAIN OILS

H. H. ROSENTHAL CO.

SERVING BUYER NEEDS HERE AND IN ALL WORLD MARKETS

DRUGS · CHEMICALS · OILS · WAXES

OVER 25 YEARS OF SERVICE

NEW YORK

25 EAST 26th STREET, NEW YORK 10, N. Y. • Cable Address "RODRUG," All Codes

HIGH MELTING POINT

ARISTOWAX

FULLY REFINED PARAFFIN WAX

PRODUCT OF

THE UNION OIL COMPANY OF CALIFORNIA

DISTRIBUTORS

PETROLEUM SPECIALTIES, INC.

400 MADISON AVENUE NEW YORK 17, N. Y.

WAR REGULATIONS SUMMARY

ALCOHOL, IMPORTED CANE—(WPB) Order L-348, controlling delivery, receipt, and processing revoked, and Schedule 71 of Order M-300 amended to delete reference to the former order.

ALLOCATIONS—(WPB) Extensions of authorizations for use of allocated chemicals under the "one-letter" plan discontinued. Applicants now required to use forms required by the governing order.

AMYL ALCOHOL AND ACETATE—(WPB) Schedule 100 of Order M-300 revoked, control being transferred to Order M-340.

ATABRINE—(WPB) Placed under allocation control of Schedule 111 of Order M-300.

CALCIUM CARBIDE—(WPB) Allocation control transferred from revoked Order M-190 to Schedule 112 of Order M-300.

CAMPHOR, SYNTHETIC—(WPB)— Allocation control transferred from Schedule 75 of Order M-300 to Order M-340.

CANCELLATION OF WAR CONTRACTS—(WPB) Amendment to Directive 40 provides for cancellation as rapidly as possible after V-J Day.

CARNAUBA WAX—(OPA) Contrary to rumors rife since June 15, when OPA rejected a request for removal of ceiling prices, the agency does not contemplate any change in present schedules.

CASEIN—(WPB) Small-order exemption raised from 6,000 to 30,000 lbs. per quarter. Now governed by Schedule 113 to Order M-300, Order M-307 having been revoked.

CHESTNUT EXTRACT—(OPA) Amendment 4 to MPR 352 changes selling price for two sellers.

CONTROLLED MATERIALS—(WPB) Direction 44 to CMP Regulation 1 and Direction 5 to CMP Regulation 4 revoked. Interpretation 32 to CMP Regulation 1 provides that any Class B product manufactured on an authorized production schedule may be sold to fill any orders received as long as rated orders are given precedence in accordance with WPB regulations. All allotments of materials identified by CMP symbols Z-1 and Z-2 for third and subsequent quarters are cancelled. The order was contained in Direction 73 to CMP Regulation 1. Direction 3 to Order M-21-B-1 also revoked.

COUMARONE-INDENE RESINS—(WPB) Excess material released for miscellaneous civilian uses under Paragraphs (f) and (g) of Order M-300.

DYEWOOD EXTRACTS—(OPA) Amendment 6 to Supplementary Regulation 14F to General MPR allows ceiling increases for logwood and fustic. Ceiling for hypernic is not increased.

GLYCOLS—(WPB) Amendment to Schedule 15 of Order M-300 removes mixed glycols containing less than 2 per cent of ethylene and triethylene glycol from allocation control.

GUM ROSIN—(OPA) Dollar-and-cent ceilings established in Revised MPR 561 maintains the present general level of maximum prices.

HYDROFLUORIC ACID, ANHYDROUS—(WPB) Schedule 4 to Order M-300 revoked.

LIME—(OPA) Increase of 75¢/net ton in f. o. b. plant ceiling prices for chemical lime produced in Ark., Kan., Neb., Okla., and western half of Mo. granted by Amendment 82 to Order A-1 under Section 1499. 159B of MPR 188.

MOLASSES—(WPB) Amendment to Order M-54 provides unlimited use of beet molasses for production of sugar for human consumption.

PRIORITIES—(WPB) Direction 8 to PR 1 permits contractors 10 days' delay in cancelling their customers' military ratings on which they are obtaining production material, permitting an orderly transfer of production from one customer to another. PR 28 and 29 provide for simplification of priority procedures. Amendment of PR 13 added 48 chemicals, including 19 synthetic detergents, to List B. Deletions from the last were allyl alcohol and chloride, anhyd. aluminum chloride, anhyd. hydrogen fluoride, chlorates and perchlorates, furfural, and tributyl glycerol triphthalate.

PROCESSING EQUIPMENT—(WPB) Deletions from, and amendments to, General Scheduling Order M-293 relaxed controls over certain types of crushers; ball, roller, stone, and pebble mills; driers, grinders, centrifuges, and evaporators.

TERPENE HYDROCARBON RESINS—(WPB) Placed under allocation control of Order M-340. Changes were made in List L to bring M-340 in line with the rosin order (M-387).

WORK GLOVES—(WPB) Direction 2 to Order M-375 restricts the sale of rubber-coated canton flannel work gloves, used by chemical workers, to customers with preference ratings.

BORAX
AND
BORIC ACID
TECHNICAL • U-S-P • SPECIAL QUALITY
CRYSTAL • GRANULATED • POWDERED
IMPALPABLE • ANHYDROUS

- Sodium Metaborate
- Potassium Borate
- Ammonium Biborate
- Ammonium Pentaborate

PACIFIC COAST BORAX COMPANY
51 MADISON AVENUE, NEW YORK 10, N. Y.
CHICAGO 16 • LOS ANGELES 14

CROSBY

THE MARK OF QUALITY

PINENE
PINE OILS
DIPENTENE
B WOOD RESIN
FF WOOD ROSIN
ALPHA TERPINEOL
TERPENE SOLVENTS
PALE WOOD ROSINS
(All grades from I to X)
LIMED WOOD ROSINS
RESINOUS CORE BINDER
STEAM-DISTILLED WOOD TURPENTINE

CROSBY NAVAL STORES, INC.
PICAYUNE, MISSISSIPPI

EXTREMELY LOW POUR POINTS

Technical White Oils

Viscosities Ranging 50 to 90 Seconds at 100° F.

PETROLEM SULFONATES
PETROLEUM WAXES
PETROLATUMS

OIL STATES PETROLEUM CO., Inc.
233 Broadway, New York 7, N. Y. Plant: Bayonne, N. J.

SULPHUR
CRUDE 99½% PURE
Free from arsenic, selenium and tellurium
MINES—Clemens, Brazoria County, Texas
JEFFERSON LAKE SULPHUR CO., INC.
SALES DIVISION
809 BANKERS MORTGAGE BLDG., HOUSTON 2, TEXAS

MASSCO-GRIGSBY
Pinch VALVES
FOR *Chemical* AND ALLIED INDUSTRIES

Easy to operate. No wear on valve mechanism. No metal parts contact pulp or liquid. No packing glands. Freezing temperatures will not destroy sleeves.

Cut Operating and Maintenance Costs

- Useful for solutions which are highly corrosive, or for solutions which crystalize at normal temperatures and must be handled at temperatures up to 300°F, or for mixtures of solutions or solids which are both corrosive and abrasive.
- Patented sleeve of valve made of rubber or synthetics to meet special requirements. The 1", 2" and 3" sizes are built for continuous pressure up to 100 lbs.; the 4", 6", 8", 10" and 12" sizes up to 150 lbs.
- Recommended for transfer lines, for controlling flow in plant and in delivering product to storage or cars. Also useful in handling fine, dry materials. *Valve shuts tight even on solid particles.* When writing, state your problem.

Send for New Illustrated Folder

DENVER
SALT LAKE CITY
EL PASO
SAN FRANCISCO
NEW YORK CITY

The Mine & Smelter Supply Co.

CANADIAN VICKERS, LTD. Montreal
W. R. JUDSON Santiago, Lima

CANADIAN NEWS

by W. A. JORDAN

Canadian DDT Picture

CANADA'S DDT position is at the moment somewhat different from that of the U. S. A., in that the five ton a week output of the Naugatuck DDT plant is not required in toto for military needs, and most has been channelled to forest spraying experiments. Therefore, the Government has permitted the manufacture of barn sprays, with the stated thought that such an end use is contributory to food production, but as yet no DDT has been released for household or other purposes.

It is reported, officially, however, that it is probable that some DDT will be made available "in the next few months" for sprays to be used in food storage, hospitals, and institutions, and it is felt that by next season DDT will be more freely available.

Northrop and Lyman, Ltd., Toronto pharmaceutical and insecticide manufacturers, are completing plans currently for the manufacture and distribution of an extensive line of DDT sprays. According to company officials, this organization, which incidentally was the first Canadian manufacturer of pyrethrum sprays in the early '20's and at present is a major producer of thiocyanate-based insecticides, will be booking DDT spray orders this Fall for delivery next season. Most of the output will be for domestic consumption, under existing regulations, although exports to the West Indies and Panama are also planned.

Currently Canadian DDT is selling at 90 cents a pound in 1000 pound lots, and it is believed that DDT sprays will be marketed at $4.50 to $5.00 per Imperial gallon—in gallon quantities. Of substantial concern to spray manufacturers, however, is the thought that the wide, and frequently grossly inaccurate, publicity which has been given to the "miracle" properties of the insecticide may well have an eventual adverse effect on DDT sales, in that the public has been led to expect a "one-spray-per-season" kill-all.

Incidentally, the Department of Lands and Forests reports that it is as yet too early to assess the effectiveness of DDT used in the department's experimental campaign against the spruce budworm, but results to date are regarded as favorable. More than 100 square miles of forest in the Black Sturgeon area of Lake Nipigon have been sprayed this year, and entomologists have reported that from 20 to 60 per cent of the budworms found in the trees in the sprayed areas were dead, while in unsprayed sections only 3.6 per cent were dead.

Fine Chemicals Expands

Fine Chemicals of Canada, Ltd., Toronto, plans the construction of an $80,000 plant for the expansion of manufacturing activities as an initial step in the company's $400,000 extension program. Work on the first unit—20,000 square feet—will be begun as soon as building permit arrangements are completed.

Fine Chemicals, founded five years ago by E. G. Dentay—formerly of Hungary—occupies a unique place in the Canadian chemical industry as the only manufacturer engaged basically in the preparation of a number of botanical and glandular extracts, such as ergot, belladonna, adrenal, cortical, etc. Too, the company is the sole Canadian producer of such fine chemicals as nikethamide, from imported nicotinic acid, and the vitamin A intermediate, 3,5-dinitrobenzoyl chloride.

Dominion Magnesium Buys Plant

Dominion Magnesium, Ltd., government-financed ($3.4 million) sole Canadian producer of magnesium metal, has been sold by the government to the company for $1.4 million, payable $100,000 cash and the balance at the rate of 1 cent per pound of magnesium sold.

Established primarily as a proving plant for the Pidgeon reduction process, and owning the Pidgeon patents, original costs were as high as 50 cents per pound, but it is claimed are now about 20 cents per pound, with a 14 cent cost said to be attainable.

The company plans an additional $500,000 investment in plant and equipment and has acquired a major interest in the Renfrew, Ont., magnesium fabricating plant.

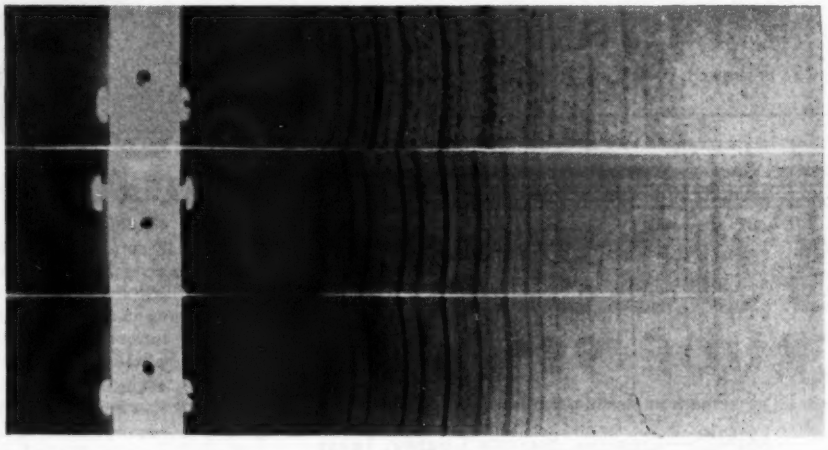
Eastman Toronto Outlet Spotlights Rayon Potential

Tennessee Eastman Corporation has completed arrangements as of August 1 to expand its marketing of acetate rayon dyestuffs in Canada with the appointment of Canadian Kodak Co., Ltd., Toronto, as its distributor. Heretofore the Eastman dyes have been shipped direct from the Kingsport, Tennessee, plant, but henceforth stocks will be maintained by the Canadian subsidiary to expedite deliveries to the Canadian textile trade. Sales at Canadian Kodak will be under the supervision of L. J. Schoonmaker.

The new trade arrangement was decided upon by Eastman in the light of Canada's increasing acetate rayon production, and the observation that there is considerable reason to believe that the rayon output of the Dominion will expand substantially in the future.

Significantly, the annual report of Canada's largest cotton textile corporation noted the fact for the first time this year with the recording of the inroads rayon has made on the cotton domain and the statement that should the cost

X-Ray Shows Japanese Have RDX



Strips cut from the circular X-ray diffraction patterns of TNT (top), Canadian RDX (bottom) and an unknown Japanese explosive (center) were placed side by side recently in the laboratories of Canadian Industries Ltd. The exact similarity of lines in the bottom two identified the Jap explosive beyond all doubt as RDX.

For all industrial and research purposes

THREE important properties—purity, uniformity, freshness—characterize *Kodak Hydroquinone*. It is held to rigid purity standards by the stringency of photographic requirements . . . years of manufacturing experience contribute to its uniformity . . . continuous production assures its freshness. *Kodak Hydroquinone* is recommended for all industrial and research purposes. Quotations will be furnished promptly upon request. Eastman Kodak Company, *Chemical Sales Division*, Rochester 4, N. Y.

KODAK Hydroquinone

Chemically Pure

TESTED EK CHEMICALS

MAGNESIUM

CARBONATES
HYDROXIDES
OXIDES

U. S. P. TECHNICAL AND SPECIAL GRADES

MARINCO BRAND

MARINE MAGNESIUM

PRODUCTS CORPORATION

Main Office, Plant and Laboratories
SOUTH SAN FRANCISCO, CALIFORNIA

Distributors

WHITTAKER, CLARK & DANIELS, INC.
NEW YORK: 260 West Broadway
CHICAGO: Harry Holland & Son, Inc.
CLEVELAND: Palmer Supplies Company
TORONTO: Richardson Agencies, Ltd.

G. S. ROBINS & COMPANY
ST. LOUIS: 126 Chouteau Avenue

ORIGINAL PRODUCERS OF MAGNESIUM SALTS FROM SEA WATER

©1945 Marine Magnesium Products Corp

MARGARIC ACID

This acid now available in small quantities is of great interest as a raw material in the preparation of medicinals. Present production can be greatly increased. We are also able to supply C-13, C-15 and C-19 acids and their esters. Write for a copy of our June 15 price list.

Columbia Organic Chemicals Co., Inc.

Office: 600 Capitol Place
Plant: Garner's Ferry Road
Columbia, S. C.

EDWAL *Special Chemicals*

Sodium Cyanate
Allyl Bromide
Methyl and Ethyl Iodide
Metallo-Acetylacetonates

Our Price List No. 9-C (dated July, 1945) lists many chemicals not previously shown. Write for your copy today.

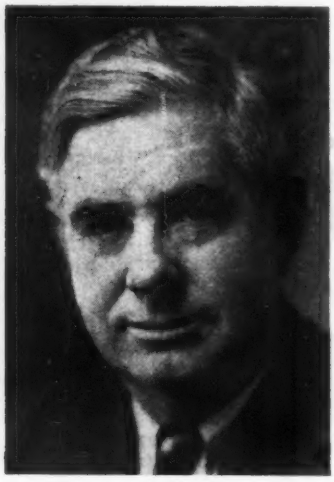
EDWAL

The EDWAL Manufacturing Division Laboratories, Inc.
732 FEDERAL STREET CHICAGO, ILLINOIS

of rayon staple fibre become lower than raw cotton, "there is no telling where the supplanting of cotton by rayon may end." It is obvious that closer competition between rayon and cotton in forest-rich Canada is somewhat more immediately probable than in cotton-producing U. S. A., with the outcome to be determined essentially by basic areas of cost.

At present Canadian Celanese, Ltd., is constructing an eight million pound per annum addition to its Drummondville, Quebec, plant, and Canadian Industries, Ltd., has acknowledged its consideration of possible postwar production of rayon.

L. E. Westman Dies



Leroy E. Westman, immediate past president of the Chemical Institute of Canada and past secretary of the Canadian Institute of Chemistry, died July 1 of a heart attack while golfing near his home in Toronto. Mr. Westman had only recently resigned as executive director of the national Bureau of Technical Personnel in Ottawa to return to his own business, Westman Publications, Ltd. He was founder and editorial director of Canadian Chemical and Process Industries *and was instrumental in effecting the consolidation last year of Canada's three national chemical societies.*

Nylon Capacity Increased

Canadian Industries, Ltd. (I.C.I.-Du Pont), has begun construction of a $4 million extension to its Kingston, Ontario, nylon plant to provide additional spinning, textile, and service facilities. It is anticipated that the new unit will be completed by mid-1946, according to Dr. H. G. Littler, manager of C.I.L.'s Chemical Group.

Original capacity of the Kingston plant, established in 1942, was 400,000 pounds of nylon yarn annually, which was later increased to its present capacity of 1,500,000 pounds. The new addition will bring total capacity of the plant to 2,250,000 pounds of yarn per year.

The extension will be 211 by 484 feet, one and two stories, of steel and brick construction, with an enlargement of the main office building also planned. It is intended, in addition, to install equipment to make nylon polymer flake from nylon salt solution to be imported from the U. S. A.

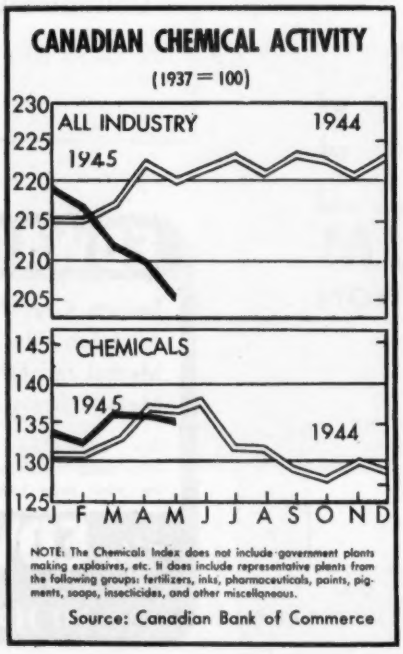
Since the original section of the Kingston plant was built three years ago the entire nylon output has been allocated for direct war purposes, and although the end of the war in Europe has led to a reduction in military needs for some materials, company officials do not anticipate that it will be possible to release nylon for the production of civilian goods in Canada until the Japanese war is concluded.

Chemical Imports Down; Exports Up

Canada's imports of chemicals and allied products, almost 90 per cent of which originate in the U. S. A. show a decline of $1.6 million for the first five months of this year compared with 1944, to stand at $32.8 million. The major decrease was recorded in the month of May, which was an even million dollars below May, 1944, at $7.0 million.

The main groups, in millions of dollars, with 1944 values in brackets, are as follows: acids, $1.34 ($1.28); cellulose products, $2.2 ($2.0); drugs and medicines, $3.9 ($3.2); dyeing and tanning materials, $3.3 ($2.9); fertilizers, $1.2 ($2.17); paints and varnishes, $3.6 ($3.2); inorganic chemicals, $4.3 ($5.2); soda compounds, $1.4 ($2.3).

Chemical exports are up $18 million for the same period, at $57.6 million, with acids listed as $1.4 ($0.9); fertilizers, $12.7 ($11.2); and soda compounds, $2.7 ($1.7).



Corning Entering Canada

Corning Glass Works, Corning, N. Y., is entering Canada with its purchase from the government of a section of the $18 million, war-created, Research Enterprises, Ltd., optical glass plant. Corning has taken over the "mobile assembly" building of Research Enterprises, original cost of which to the government was $522,000, for a total purchase price of $150,000.

This purchase is said to be the first "foreign" manufacturing investment made by Corning, and the facilities are being adapted to the manufacture of glass baking ware, based on silica imported from the U. S. A.

J. R. Donald Resigns

J. R. Donald, director-general, chemicals and explosives division, Department of Munitions and Supply, has resigned from his wartime post and after completing a special Departmental trip to Europe will reassume his duties as president, J. T. Donald & Co., Ltd., consulting engineers. Mr. Donald, key man in the planning and development of Canada's chemicals program, will be replaced by E. T. Sterne, chemicals controller since 1942.

Sherwin-Williams Steps Up Insecticide Activities

Sherwin-Williams Co. of Canada Ltd., which in contrast to the parent U. S. A. organization has never been particularly active in the insecticide field, is now organizing an Insecticide Division under A. H. Carter, and plans greatly expanded manufacturing and marketing activities. Present indications are that with some 7,000 established retail outlets for its other products, and 100 detail salesmen, Sherwin-Williams may well become a dominant factor in the Canadian market, particularly as to the sale of packaged insecticides.

In the past this company has been the sole Canadian manufacturer of paris green, and in addition has distributed lime-sulfur, bordeaux mixture, and a few sundry items. At present, through its newly created division, the company is marketing DDT barn spray, claimed to be the first time that such a spray has been made available to the public in North America, and composed essentially of an aromatic solvent solution of Naugatuck-produced DDT.

Plans drafted for next season call for the distribution of some thirty insecticides and related products under the Green Cross trademark, including basic carbonates, micronized sulfur, Stop Drop, 24-D, and Atlas NNOR aphid control agent.

ZINC STEARATE
U. S. P.

ALUMINUM STEARATE

CALCIUM STEARATE

JOSEPH TURNER & CO.

83 EXCHANGE PLACE
PROVIDENCE, R. I.

RIDGEFIELD, NEW JERSEY

40th ST. & CALUMET AVE.
CHICAGO 15, ILL.

DRUMS

● **Full removable head containers.**
Where added strength and security are needed use our "Bolted Ring Seal" drum supplied in sizes from 10 to 70 gallons. Suitable for solids and semi-liquids. Consult us freely on your packaging problems. ●

a complete line of light gauge containers

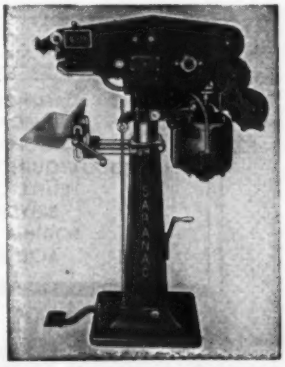
EASTERN STEEL BARREL CORPORATION
BOUND BROOK NEW JERSEY

FULL MEASURE IN EVERY BAG

With the Sift-Proof Fold

Saranac Model D Bag Sealers, closing packages at one stroke with a tight reverse double fold, make the seal *the strongest part of the bag*. Production — 600 to 800 closures an hour — is fast and economical.

WRITE FOR BULLETIN C1-8



SARANAC MACHINE CO.
BENTON HARBOR, MICHIGAN

OLDBURY
ELECTRO-CHEMICAL
COMPANY

●

PHOSPHORUS TRICHLORIDE

●

PRODUCTION problems connected with Phosphorus Trichloride parallel very closely those of Phosphorus Oxychloride. Here again experience and continuous technical improvements enable us to produce a material remarkably free from impurities.

Shipping containers are returnable drums and tank cars.

●

Plant and Main Office:
NIAGARA FALLS, NEW YORK

New York Office:
22 EAST 40TH ST., NEW YORK 16, N.Y.

EXPORTS *and* EXPERTS

Taking part in America's great program to find markets for the products of the nation's increased industrial equipment, thus sustaining the high rate of employment, Otis, McAllister & Co. offer their services. If you are a manufacturer, we can take over your entire sales operations on a mutually profitable basis.

We have the sales organization both here and abroad, backed by half a century of world trading experience, with full knowledge of foreign credits and merchandising.

Now is the time to formulate your plans for peacetime operations.

OTIS, McALLISTER & CO.

World Traders since 1892

310 Sansome St., San Francisco 4
Canal Building, New Orleans 12

Los Angeles Chicago New York

STANDARD

"THE ORIGINAL SYNTHETIC SOLVENT MANUFACTURERS"

ISOPROPYL ALCOHOL

Recommended for lacquers, resins, artificial leather, laminating varnishes, and many additional industrial solvent applications.

Isopropyl Alcohol is on allocation. Details for obtaining allocations of Isopropyl Alcohol will be gladly furnished.

STANDARD ALCOHOL CO.
26 BROADWAY - - NEW YORK 4, N.Y.

PENACOL

RESORCIN

TECHNICAL U. S. P.

CATECHOL

C. P. CRYSTALS RESUBLIMED

•

Samples and prices on request

PENNSYLVANIA COAL PRODUCTS COMPANY
PETROLIA • PENNSYLVANIA
Cable: PENACOL Phone: Brule, Pa., 2641

Exports to South Africa

American Manufacturers and exporters of chemicals, especially for processing food and allied raw materials are requested to communicate with the experienced importing firm and agency.

INDUSTRIAL SUPPLY CO. (PTY) LTD.
P. O. BOX 279, CAPE TOWN

Edw. S. Burke
J. F. Hollywood

AMINOPHYLLINE U.S.P.
THEOPHYLLINE U.S.P.
CHINIOFON (YATREN) U.S.P.
IODOXYQUINOLIN SULPHONIC ACID
ETHYL CYANO ACETATE
8-HYDROXYQUINOLIN
SODIUM BENZOATE U.S.P.
ACID BENZOIC U.S.P.

EDW. S. BURKE
ESTABLISHED 1917
65 PINE STREET, NEW YORK 5, N. Y.
Representing:
CARUS CHEMICAL CO., INC. BENZOL PRODUCTS CO.

CHEMICAL ECONOMICS & STATISTICS

Carbon Black Sales Exceed Output

Increasing demand for synthetic rubber compounding, particularly in the late months of 1944, lifted sales and production of carbon black to new peaks, according to the Bureau of Mines, U. S. Department of the Interior.

Total sales expanded 49 per cent over 1943 to 937,430,000 pounds and were 135,570,000 pounds more than production. Producers' stocks were therefore depleted to 69,243,000 pounds at the year-end, the lowest level since 1928, and continued to shrink in the first quarter of 1945.

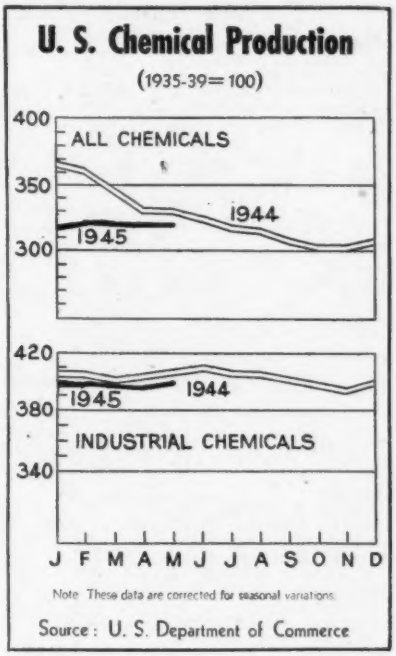
Production gained 35 per cent over 1943 to 801,860,000 pounds, or 207,795,000 pounds above the old high in 1941. The output by contact processes increased 9 per cent in 1944, following a 3 year decline, but was 17 per cent below the record of 1940. Furnace black production continued to grow rapidly, increasing 81 per cent over 1943 to 387,184,000 pounds and equalling 48 per cent of total production of carbon black in 1944, compared with 36 per cent in 1943.

Carbon black plants burned 355,770 million cubic feet of natural gas in 1944, a moderate increase (13 per cent) over 1943 compared with the output gain (35 per cent). The average yield of all grades of carbon black increased from 1.88 pounds per thousand cubic feet in 1943 to 2.20 pounds in 1944, influenced by the greater importance of high-yield furnace blacks. The average value of natural gas used by the plants advanced to 1.62 cents per thousand cubic feet, from 1.47 cents in 1943.

Record sales to rubber companies of 738,029,000 pounds, accounted for 79 per cent of the 1944 total. Sales to ink and paint manufacturers and to miscellaneous industries including exports, were slightly above 1943.

The average value of carbon black at the plants was 3.67 cents per pound in 1944, and 3.41 cents in 1942 and 1943.

Three plants (2 channel in Oklahoma and 1 special contact type in Louisiana) were not operated in 1944 and 3 new furnace plants (1 in Oklahoma and 2 in Texas) began to produce.



Boron Output Rises

Increased domestic use of boron compounds in glass and fertilizers accounted for the highest boron-mineral production since 1941, according to the Bureau of Mines, United States Department of the Interior. Sales of contained B_2O_3 were 91,700 short tons in compounds valued at $6,579,587, a quantity increase of 5 percent over 1943. In addition to glass and fertilizer, boron compounds are also used in water treatment, soaps, medicines, ferrous alloys, and flame-resisting paints. The main prewar use was in enamels, but this market has been negligible in recent years owing to the shortage of steel for making enamelware.

American Potash & Chemical Corporation, 122 East Forty-second Street, New York City, continued its extraction of borax, dehydrated borax, and boric acid from the brines of Searles Lake at Trona, Calif. Pacific Alkali Co., 1223 Pacific Mutual Bldg., Los Angeles, Calif., recovered borax from Owens Lake at Bartlett, Calif. This firm was purchased by Columbia Chemical Division, Pittsburgh Plate Glass Co., 1223 Pacific Mutual

Cellulose Plastic Products: Production, Shipments, and Consumption, Classified by Type, for the United States

With this release, the data on cellulose plastic products are brought up to date, and regular publication of monthly figures is resumed. Figures beginning January 1942, together with a description of some of the limitations of the data appeared in a special press release dated March 2, 1945. This release and statistics for earlier months available in the current Statistical Service reports covering these products may be obtained from the Bureau of the Census, Washington 25, D. C.

Data for a number of additional plastic materials, including phenolic and other tar acid resins, urea resins, and vinyl resins, will be available within the next few months. With the publication of these figures, a fairly complete record of current operations in the plastics materials industry will be available.

(In pounds)

	Nitrocellulose						Cellulose Acetate					
	Total		Sheets		Rods		Tubes		Sheets-rods-tubes		Molding composition	
Year and Month	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments and consumption	Production	Shipments and consumption
1944												
United States, Total	15,950,523	16,077,752	9,956,251	9,988,833	4,902,742	5,018,401	1,091,530	1,070,518	8,279,638	8,798,047	56,746,334	52,301,243
January	1,275,119	1,209,993	791,671	770,263	409,823	377,964	73,625	61,766	798,925	838,260	4,040,660	3,705,769
February	1,443,101	1,318,505	920,565	793,903	450,050	472,650	72,486	51,952	721,952	868,261	4,213,788	4,019,165
March	1,468,320	1,479,146	931,996	917,165	459,720	480,003	76,604	81,978	646,137	822,248	4,482,339	3,878,183
April	1,474,637	1,511,507	947,496	951,989	431,395	467,117	95,746	92,401	676,416	622,199	4,878,333	4,544,239
May	1,456,855	1,469,530	882,587	897,395	484,628	483,626	89,640	88,509	762,307	842,301	5,204,868	4,672,882
June	1,468,681	1,561,850	907,405	943,928	448,191	505,433	113,085	112,489	704,136	757,546	4,860,128	4,528,425
July	1,198,118	1,291,518	726,664	774,303	381,927	419,223	89,527	97,992	736,111	675,785	4,517,606	4,207,545
August	1,382,746	1,319,348	894,642	820,133	396,356	410,655	91,748	88,560	730,922	731,818	5,007,831	4,504,670
September	1,191,424	1,200,872	788,040	741,446	303,861	361,981	99,523	97,445	548,796	666,192	4,915,504	4,409,157
October	1,331,647	1,340,346	831,425	843,648	402,020	387,555	98,202	109,143	604,540	617,910	4,823,578	4,542,552
November	1,222,630	1,378,795	731,496	892,328	383,950	388,520	107,184	97,947	755,284	799,261	5,092,975	4,797,228
December	1,037,245	996,342	602,264	642,332	350,821	263,674	84,160	90,336	594,112	556,266	4,708,724	4,491,428
1945												
United States, Total	6,308,165	6,406,137	3,470,839	3,554,454	2,199,909	2,187,479	637,417	570,819	4,119,834	4,107,875	24,079,609	22,465,421
January	1,259,768	1,230,102	663,458	692,537	458,915	428,452	137,395	109,113	841,406	816,121	4,819,932	4,401,499
February	1,214,829	1,295,767	658,856	771,611	442,136	422,957	113,837	101,199	857,620	829,128	4,886,869	4,309,331
March	1,236,037	1,287,833	696,519	726,268	422,545	444,650	116,973	116,915	891,136	879,085	4,722,968	4,667,360
April	1,236,597	1,208,522	685,837	678,201	411,564	410,013	139,196	120,308	749,030	787,702	4,562,458	4,199,113
May	1,360,934	1,383,913	766,169	685,837	464,749	481,407	130,016	123,284	780,642	795,839	5,087,382	4,888,118

Bldg., Los Angeles, on Dec. 1, 1944, at which time a labor shortage prevented further production of borax in 1944. Pacific Coast Borax Co. increased its production of kernite and tincal from its mines at Boron, Calif., for use in over 200 boron derivatives. The firm is expanding its plant in anticipation of heavy postwar demand. United States Borax Co., 510 West Sixth Street, Los Angeles, mined colemanite (crude calcium borate) near Shoshone, Inyo County, Calif., for refining by another producer. West End Chemical Co., 608 Latham Square Bldg., recovered borax and dehydrated borax from Searles Lake at its Westend plant.

Magnesium Compounds in 1944

Production of several magnesium raw materials for use in refractories, magnesium metal, and other essential commodities declined in 1944 compared with 1943, according to the Bureau of Mines, U. S. Department of the Interior. Reduction in the magnesium metal program was responsible for many of the decreases.

Magnesite production in the United States in 1944, 561,450 short tons, valued at $4,407,461, was higher than in any previous year except 1943. The decline from the high level of 1943 was caused by the closing of Basic Magnesium, Inc.'s flotation plant at Gabbs, Nev., late in 1944. Demand for magnesia in refractories was heavy, though less than in 1943. Sales of caustic-calcined magnesite for oxychloride cement flooring declined, but shipments of caustic-calcined magnesite for use in fertilizers, epsom salt, and rubber remained high.

Available information indicates that there will be a considerable excess of supply of magnesia over demand in postwar years. Acute competition anticipated in certain grades may be made still keener if magnesium metal plants and their affiliates should convert their plants to make magnesium oxide. Most of these plants which do not use the ferrosilicon process could, without undue difficulty, convert to magnesia manufacture.

Little change is looked for in present sources of maintenance grade magnesia, but competition is expected to be active in brick-making grades of imported dead-burned magnesite and domestic sea-water magnesia, the former being a little cheaper (perhaps $36 a short ton at Philadelphia as against $40 or more for sea-water magnesia) but the latter offering greater purity and better control over final product.

Dolomite

Crushed dolomite, both raw and calcined, is used in large quantities in maintaining basic open-hearth furnaces, added alone or mixed with slag. Production of dead-burned dolomite rose in 1944.

Curtailment in production of magnesium

Naval Stores Production

(By naval stores seasons, beginning April 1 and ending March 31)

Table 1. Production of Turpentine (Bbls.—50 gals.)

	1944-45 12 mos. (Apr.-Mar.) Total	Gum	Wood	1943-44 12 mos. (Apr.-Mar.) Total	Gum	Wood
Gum	245,194	245,194	.....	288,382	288,382	.....
Wood						
Steam Dist.	117,265	.....	117,265	125,171	.....	125,171
Sulphate	104,307	.....	104,307	91,045	.....	91,045
Dest. Dist.	4,477	.....	4,477	3,834	.....	3,834
Total	471,243	245,194	226,049	508,432	288,382	220,050

Table 2. Production of Rosin (Drums 520 lbs. net)

Gum	684,146	684,146	.....	773,741	773,741	.....
Reclaimed gum	8,066	8,066	.....	9,824	9,824	.....
Wood						
Steam Dist.	625,700	.....	625,700	679,266	.....	679,266
Sulphate	.....	.....	.....	.....	.....	.....
Dest. Dist.	.....	.....	.....	.....	.....	.....
Total	1,317,912	692,212	625,700	1,462,831	783,565	679,266

Table 3. Production of Black Liquor Soap and Tall Oil (in tons)

Black Liquor Soap Reported as produced	197,437	173,535
Black Liquor Soap Reported as acidified	162,354	140,049
To produce according to reports Crude Tall Oil	80,060	70,427

Table 4. Miscellaneous Naval Stores (Bbls.—50 gals.)

	1944-45 12 mos. (Apr.-Mar.) Production	1945 Mar. 31 Stocks	1943-44 12 mos. (Apr.-Mar.) Production	1944 Mar. 31 Stocks
Pine oil	103,487	10,299	106,342	7,188
Pine tar	84,767	1,526	95,768	810
Dipentene	18,636	3,189	18,406	4,102
Other Monocyclic Hydrocarbons	33,716	5,021	34,897	4,817

Table 5. Reported Consumption of Turpentine in the United States

(Bbls.—50 gal.)

	1944-45 12 mos. (Apr.-Mar.) Total	Gum[1]	Wood[1]	1943-44 12 mos. (Apr.-Mar.) Total	Gum[1]	Wood[1]
Abattoirs	0			0		
Adhesives & plastics	352			467		
Asphaltic products	0			0		
Automobiles & wagons	175			242		
Chemicals & pharmaceuticals	129,957			122,368		
Ester gum & syntheti resins	13,914			122,368		
Foundries & foundry supplies	626			623		
Furniture	176			239		
Insecticides & disinfectants	115			[illegible]		
Linoleum & floor covering	41			33		
Matches	0			0		
Oils & greases	274			73		
Paint, varnish & lacquer	20,745			23,690		
Paper & paper size	0			0		
Printing ink	307			207		
Railroads & shipyards	9,977			9,928		
Rubber	657			123		
Shoe polish & shoe materials	12,620			13,806		
Soap	0			0		
Other industries	260			183		
Total industrial reported	190,196	44,064	146,132	187,379	31,282	156,097

[1] Separation of gum and wood turpentine consumption will be limited for the present to the total reported.

Table 6. Reported Consumption of Rosin in the United States

(Drums—520 lbs. net)

	1944-45 12 mos. (Apr.-Mar.) Total	Gum[1]	Wood[1]	1943-44 12 mos. (Apr.-Mar.) Total	Gum[1]	Wood[1]
Abattoirs	874			733		
Adhesives & plastics	30,926			20,046		
Asphaltic products	2,473			2,394		
Automobiles & wagons	246			153		
Chemicals & pharmaceuticals	265,022			182,004		
Ester gum & synthetic resins	249,252			146,618		
Foundries & foundry supplies	14,979			17,476		
Furniture	7			9		
Insecticides & disinfectants	6,032			5,530		
Linoleum & floor covering	19,152			14,687		
Matches	1,291			1,485		
Oils & greases	42,372			29,921		
Paint, varnish & lacquer	133,136			126,340		
Paper & paper size	379,383			382,367		
Printing ink	12,680			16,618		
Railroads & shipyards	24,855			11,896		
Rubber	22,529			11,383		
Shoe polish & shoe materials	7,235			9,852		
Soap	324,164			327,058		
Other industries	4,758			6,089		
Total industrial reported	1,541,366	947,473	593,893	1,312,659	733,560	579,099

[1] Separation of gum and wood rosin consumption will be limited for the present to the total reported.

Chemicals: U. S. Production, Consumption, and Stocks
Annual 1944, January, February, March, First Quarter, 1945

Item	Annual 1944	January 1945	February 1945	March 1945	First Quarter
Ammonium Sulphate[1] (Short Tons)					
Production	813,937	67,395	62,525	70,393	200,313
Consumption in producing plant	493	1	2	2	5
Stocks, end of period	69,032	60,383	47,014	34,481	34,481
Borax, Refined ($Na_2B_4O_7 \cdot 10HO$ content) (Short Tons)					
Production	210,065	19,128	16,656	17,756	53,540
Consumption in producing plant	...	...	...	...	...
Stocks, end of period	15,562	16,733	15,293	14,751	14,751
Cobalt, Compounds[2] (Pounds)					
Production	2,825,333	311,436	223,711	352,883	888,030
Consumption, in producing plant	87,315	1,487	...	12,005	13,492
Stocks, end ofperiod	401,427	432,017	403,354	316,631	316,631
Cobalt, Driers[3] (Pounds)					
Production	6,589,948	632,889	560,796	749,576	1,943,261
Consumption, in producing plant	283,129	16,049	8,931	10,262	35,242
Stocks, end of period	256,959	242,836	207,205	227,204	227,204
Copper Sulphate (25% Copper Content) (Short Tons)					
Production	101,869	10,490	9,981	10,840	31,311
Consumption, in producing plant	11,621	1,176	1,326	995	3,497
Stocks, end of period	10,234	10,977	9,151	8,163	8,163
Sulphur (Long Tons)					
Production	3,218,156	275,722	260,677	290,268	826,667
Consumption, in producing plant	...	...	...	...	...
Stocks[4], end of period	4,100,320	3,493,834	3,461,772	3,366,497	3,366,497
Zinc Oxide (Lead Free) (Short Tons)					
Production	152,647	11,442	10,961	12,411	34,814
Consumption, in producing plant	...	...	...	...	...
Stocks, end of period	50,793	17,631	16,600	15,677	15,677
Zinc Oxide (Leaded) (Short Tons)					
Production	65,240	5,628	5,460	5,733	16,821
Consumption, in producing plant	...	...	...	...	...
Stocks end of period	6,434	2,435	2,682	2,632	2,632
Zinc Chloride (dry eight) (Short Tons)					
Production	19,630	1,521	1,444	1,913	4,878
Consumption, in producing plant	12,023	1,197	1,049	1,113	3,359
Stocks, end of month	1,696	1,333	1,229	1,565	1,565
Zinc Ammonium Chloride (dry weight) (Short Tons)					
Production	9,421	1,007	1,029	1,131	3,167
Consumption, in producing plant	...	...	...	...	...
Stocks, end of month	669	653	648	607	607
Zinc Chloride (dry weight) (Short Tons)					
Production	11,534	1,006	1,076	1,090	3,172
Consumption, in producing plant	...	...	...	...	...
Stocks, end of month	678	538	610	571	571
Zinc Chemicals Misc.[5] (Short Tons)					
Production	3,792	336	348	301	985
Consumption, in producing plant	...	...	...	...	...
Stocks, end of month	495	2	...	1	1

[1] Does not include synthetic ammonium sulphate the production of which is reported to the Bureau of the Census. Data for synthetic ammonium sulphate cannot be published.

[2] Includes oxide, hydrate and salts. Cobalt content of production:

	Pounds
Annual, 1944	638,329
January, 1945	95,468
February 1945	73,314
March, 1945	72,130
1st Qtr., 1945	240,912

[3] Cobalt content of production:

	Pounds
Annual, 1944	396,402
January, 1945	29,966
February, 1945	32,926
March, 1945	39,855
1st Qtr., 1945	102,747

[4] Stocks at mine, in transit, or at warehouse.

[5] Includes zinc carbonate, chromated zinc chloride, zinc cyanide, zinc peroxide, zinc sulfocarbolate, etc.

Chemicals: United States Production, Consumption, and Stocks, March 1945

Statistics on the production, consumption and stocks of chemicals shown in the following table supplement the 1941-1943 figures released February 7, 1944, in "Facts for Industry," Series 6-1-1. Figures for earlier months, information on the number of plants manufacturing each chemical, and a discussion of the limitations of the data are given in the above-mentioned publication. The production figures represent primary production and do not include purchased or transferred material. The consumption statistics are for consumption only in the plants where each chemical is produced. The stocks figures represent the quantities of each chemical on hand at the end of the month at producing locations only.

		March (Preliminary)		
Chemical and Basis	Unit	Production	Consumption in producing plants	Stocks at producing plants, end of month
Acetylene:				
For use in chemical synthesis	M cu. ft.	299,704	76,441	10,049
For commercial purposes	M cu. ft.	144,283		
Aluminum chloride:				
Anhydrous and crystal (100% $AlCl_3$)	M pounds	5,186	(1)	2,971
Solution (32° Be')	M pounds	993	...	
Aluminum sulfate:				
Commercial (100% $Al_2(SO_4)_3$)	M pounds	(2)	(2)	(2)
Iron free (100% Al2 $(SO_4)_3$)	M pounds	(2)	(2)	(2)
Synthetic anhydrous ammonia (100% NH_3)[3]	Short tons	49,089	28,712	4,649
Ammonium chloride (100% NH_4Cl)	M pounds	5,538	...	1,782
Barium sulfate (Blanc fixe') (100% $Ba SO_4$)	M pounds	3,966	2,358	4,356
Bleaching powder (35-37% Available Cl_2)	M pounds	2,950	...	584
Calcium acetate (80% Ca $(C_2H_3O_2)_2$)	M pounds	583	...	131
Calcium arsenate (100% Ca_3 $(AsO_4)_2$)	M pounds	3,006	(1)	16,521
Calcium carbide (Commercial)	Short tons	62,753	(4)	22,649
Calcium hypochlorite (true) (70% Available Cl_2)	M pounds	1,377	(1)	940
Calcium phosphate:				
Monobasic (100% $CaH_4(PO_4)_2$)	M pounds	6,032	(1)	4,767
Dibasic (100% $CaHPO_4$)	M pounds	3,807	(1)	3,552
Carbon, activated)	M pounds	5,205	(1)	4,397

metal forced a reduction in output of magnesium chloride in 1944. Production in 1945 is expected to be a great deal lower. Small declines were noted in production of precipitated magnesium carbonate, most of which is used in making 85-per cent magnesia insulation—and in output of magnesium sulfate—used as a fertilizer, in tanning, in pharmaceuticals, and in aqueous solutions as a rayon coagulant. Sales of pharmaceutical-grade magnesium oxide and hydroxide were higher on account of the demand for high-grade oxide in making synthetic rubber.

Gypsum Output Declines

Continuing impediments to construction resulted in a 3 per cent decrease in crude gypsum mined in the United States in 1944 compared with 1943, according to the Bureau of Mines, United States Department of the Interior. Calcined gypsum output was 8 per cent lower and sales of uncalcined gypsum 14 per cent lower in 1944 than in 1943.

War Production Board Conservation Order L-41 has restricted all types of construction since April, 1942, and amendments during 1944 further tightened farm construction. Price control of gypsum products was continued under Maximum Price Regulation 188 of the Office of Price Administration based on March 1942 levels.

The labor shortage in the industry was more severe than in 1943, when the War Manpower Commission certified the mining of gypsum and the production of gypsum boards to the list of activities essential to the war.

Bromine Sales Set Record

Sales of bromine compounds by primary producers increased in 1944 to establish a new record, according to the Bureau of Mines, United States Department of Interior. Sales of contained bromine amounted to 102,112,462 pounds, an increase of 9 per cent over 1943. The increase was due largely to expanded production of ethylene dibromide for use in gasoline antiknock-compounds.

The Ethyl-Dow Chemical Co., pioneer producer of bromine from seawater, completed expansions at both its Wilmington, (N. C.) and Freeport, (Tex.) plants in 1944. Dow Chemical Co., Midland, Mich., the second largest producer, recovered bromine from Michigan well brines as a byproduct of magnesium and calcium chlorides. American Potash & Chemical Corp., Trona, Calif., recovered bromine from Searles Lake and Westvaco Chlorine Products Corp., Newark and Chula Vista, Calif., from seawater bitterns. The following won bromine from well brines: J. Q. Dickinson & Co., Malden, W. Va.; Great Lakes Chemical Corp., Filer City, Mich.; Michigan Chemical Corp., Saint Louis, Mich.; Morton Salt Co., Manistee,

Mich.; Pomeroy Salt Corp., Minersville, Ohio; Rademaker Chemical Corp., Eastlake, Mich.; and Westvaco Chlorine Products Corp., South Charleston, W. Va.

The largest use of bromine is in ethylene dibromide, which combines with the antiknock agent tetraethyl lead to form lead bromide. Lead in this form is not corrosive to spark points. Minor uses of bromine are in organic syntheses, in tear gas (bromobenzyl cyanide), as a chemical reagent, and in photographic emulsions.

Graphite Output Down

Production and sales of domestic natural graphite decreased in 1944. The combined total of crystalline and amorphous graphite produced from domestic mines in 1944, as reported to the Bureau of Mines, United States Department of the Interior, was 5,408 short tons and shipments reached 5,768 tons, valued at $349,663 compared with a production of 9,939 short tons and sales of 9,597 tons valued at $903,102 in 1943. The output and sales of manufactured graphite by the Ascheson Graphite Division of the National Carbon Co., Inc., 30 East Forty-Second Street, New York 17, N. Y., from a plant operated at Niagara Falls, N. Y., increased in 1944 over the previous year's total. Stocks of crucible grade graphite increased through 1944 and by the end of the year were sufficient for 15 months' supply at the current rate of consumption. On November 11, 1944, War Production Board Order M 61, controlling the allocation of graphite, was amended to remove crucible grade graphite from the strategic class, leaving only Ceylon amorphous graphite, containing 95 per cent graphitic carbon in lump or ground form, on the restricted list.

In view of the favorable stock position of Madagascar flake at the end of 1944 a Government contract for 1945 was not signed and Madagascar flake was released from public purchase at the end of the first quarter of 1945.

As reported by the Graphite Branch of the War Production Board approximately 67 short tons of domestic flake, fines and amorphous material were utilized in the manufacture of crucibles, stoppers, sleeves and nozzles in 1944.

The postwar market and prices for domestic material will depend largely on the industry's willingness to improve and standardize the grade of its product.

$CaCl_2$ Production Steady

Road stabilization, concrete mixing, and coal cleaning provided excellent markets for natural calcium chloride and calcium-magnesium chloride in 1944, according to the Bureau of Mines, United States Department of the Interior. Production in 1944 was 200,964 short tons valued at $1,621,227, a slight increase over 1943.

There were 12 producers in 1944 and 11 in 1943. (The Bureau of Mines does not canvass firms that recover calcium chloride from ammonia-soda waste liquors. There were two such operators in 1944.) The following firms reported production of calcium chloride (and calcium-magnesium chloride) from natural brines in 1944: California Rock Salt Co., 2436 Hunter Street, Los Angeles 21, Calif., plant at Amboy, Calif.; J. Q. Dickinson & Co., Malden, W. Va.; The Dow Chemical Co., Midland, Mich.; Hill Brothers Chemical Co., 2159 Bay Street, Los Angeles 21, Calif., plant at Amboy, Calif.; Liverpool Salt Co., Hartford, W. Va.; Michigan Chemical Corporation, Saint Louis, Mich.; Ohio River Salt Corporation, Mason, W. Va.; Pomeroy Salt Corporation, Pomeroy, Ohio, plant at Minersville, Ohio; Rademaker Chemical Corporation, Eastlake, Mich.; Frank Thomas, 374 Court Street, Room 11, San Bernardino, Calif., plant near Amboy, Calif.; and Westvaco Chlorine Products Corporation, 405 Lexington Ave., New York 17, N. Y., plants at Chula Vista, Calif., and South Charleston, W. Va.

Chemicals: United States Production, Consumption, and Stocks, March, 1945 (cont'd.)

Item	Unit	March (Preliminary) Production	Consumption in producing plants	Stocks at producing plants, end of month
Carbon black (Channel):				
Rubber grade	M pounds	38,039	...	9,898
Other than rubber grade	M pounds	2,539	...	13,646
Carbon dioxide:				
Liquid and gas	M pounds	19,622	2,857	2,748
Solid (dry ice)	M pounds	51,977	...	9,714
Chlorine	Short tons	107,466	62,022	5,634
Chrome green (C. P.)	M pounds	525	73	1,237
Chrome yellow and orange (C. P.)	M pounds	3,610	301	2,072
Copper acetoarsenite (Paris green)	M pounds	266	(1)	1,059
Hydrochloric acid (100% HCl)	Short tons	37,639	23,134	3,300
Hydrogen	Millions of cubic feet	2,063	1,688	(4)
Hydrogen peroxide (100 volume)	M pounds	2,738	210	1,844
Lamp black	M pounds	1,190	(1)	724
Lead arsenate (acid and basic)	M pounds	8,241	357	9,693
Iron blue (C. P.)	M pounds	779	103	845
Lead oxide:				
Red (C. P.)	M pounds	9,171	299	4,125
Yellow (C. P.)	M pounds	29,392	6,048	8,994
Methanol:				
Natural (80% CH_3OH)	M gallons	305	(4)	376
Synthetic (100% CH_3OH)	M gallons	6,791	(1)	(1)
Molybdate chrome orange (C. P.)	M pounds	129	(1)	134
Nitric acid (100% HNO_3)	Short tons	37,962	33,096	6,529
Nitrous oxide	M gallons S.T.P.	13,236	...	3,546
Oxygen	M cu. ft.	1,475,789	34,105	(5)
Phosphoric acid (50% H_3PO_4)	Short tons	53,381	47,958	11,728
Potassium bichromate and chromate (100%)	M pounds	686	...	522
Potassium hydroxide (caustic potash) (100% KOH)	Short tons	4,735	834	1,452
Soda ash (Commercial sodium carbonate):				
Ammonia soda process—				
Total wet and dry (98-100% Na_2CO_3)[6]	Short tons	380,371	...	...
Finished light (98-100% Na_2CO_3)[7]	Short tons	218,540	52,925	42,580
Finished dense (98-100% Na_2CO_3)	Short tons	103,639	2,479	21,607
Natural[8]	Short tons	15,156	...	3,304
Sodium bicarbonate (refined) (100% $NaHCO_3$)	Short tons	15,570	(1)	4,321
Sodium bichromate and chromate (100%)	Short tons	7,466	(1)	666
Sodium bisulfite (100% $NaHSO_3$)	M pounds	3,771	(1)	1,058
Sodium hydrosulfide (100% NaSH)	M pounds	1,907	(1)	480
Sodium hydrosulfite (100% $Na_2S_2O_4$)	M pounds	3,367	(1)	1,098
Sodium hydroxide (caustic soda):[9]				
Electrolytic process—				
Liquid (100% NaOH)	Short tons	101,332	...	...
Solid (100% NaOH)	Short tons	19,304	...	...
Lime-soda process—			34,356	58,104
Liquid (100% NaOH)	Short tons	66,111	...	...
Solid (100% NaOH)	Short tons	19,976	...	...
Sodium phosphate:				
Monobasic (100% (NaH_2PO_4)	Short tons	1,255	(1)	161
Dibasic (100% Na_2HPO4)	Short tons	4,554	(1)	328
Tribasic (100 Na_3PO_4)	Short tons	6,015	213	890
Meta (100% $NaPO_3$)	Short tons	2,437	(1)	307
Tetra (100% $Na_4P_2O_7$)	Short tons	2,827	107	356
Sodium silicate:				
Soluble silicate glass, liquid and solid (anhydrous)	Short tons	37,105	3,596	45,828
Sodium sulfate:				
Anhydrous (refined) (100% Na_2SO_4)	Short tons	8,163	(1)	3,117
Glauber's salt (100% Na_2SO_4 $10H_2O$)[8]	Short tons	18,153	(1)	3,763
Salt cake (crude) (commercial)[8]	Short tons	48,788	3,738	63,156
Sulfur dioxide	M pounds	6,737	3,450	2,689
Sulfuric acid:[8]				
Total (100% H_2SO_4)	Short tons	860,403	...	...
Chamber process (100% H_2SO_4)	Short tons	275,929	...	243,014
Contact process (100% H_2SO_4)[10]	Short tons	584,474	...	...
Net, contact process (100% H_2SO_4)[10 11]	Short tons	497,487	...	...
White lead:				
Basic lead carbonate (C. P.)	Short tons	2,916	1,512	2,694
Basic lead sulfate (C. P.)	Short tons	1,152	...	134
Zinc yellow (zinc chromate) C. P.)	Short tons	1,700	(1)	458

Barite in Record Quantities in 1944

Record quantities of barite were produced and consumed in the United States in 1944, according to the Bureau of Mines, United States Department of the Interior. Output was 515,136 short tons, 20 per cent over 1943, and 7 per cent greater than the previous record year 1941. Consumption, 595,563 tons, included 67,888 tons of imports, largely from Nova Scotia.

Sales of ground and crushed barite reached a new record, 344,757 short tons, a 66 per cent increase over 1943.

STEARINE PITCH

COTTONSEED

AIR BLOWN

ANIMAL

RE-RUN TO SPECIFICATION UNIFORMITY OF MELTING POINT, PENETRATION AND COLOR GUARANTEED.

ALLIED ASPHALT & MINERAL CORP.

217 Broadway, New York 7 Factory: Dunellen, N. J.

Agents and Warehouse Stocks in Principal Centers

Producers of

SULPHUR

Large stocks carried at all times, permitting prompt shipments . . . Uniformly high purity of 99½% or better . . . Free of arsenic, selenium and tellurium.

TEXAS GULF SULPHUR CO.

75 E. 45th Street New York 17, N.Y. Inc.

Mine: Newgulf, Texas

FREEPORT

Ample stocks of 99.5% pure crude sulphur—free from arsenic, selenium and tellurium—plus up-to-date production and shipping facilities at our mines at Port Sulphur, Louisiana, and Freeport, Texas, assure our customers the utmost in steady, dependable service. Freeport Sulphur Company, 122 East 42nd Street, New York

SULPHUR

Exports to Switzerland

American Manufacturers and exporters of chemicals, solvents, oils, waxes and allied raw materials are requested to communicate with the experienced importing firm and agency.

WALTER MOESCH & CO.

ZURICH, SWITZERLAND

ESTABLISHED 1880

WM. S. GRAY & CO.

342 MADISON AVENUE, NEW YORK

Murray Hill 2-3100 *Cable: Graylime*

SODIUM BENZOATE U.S.P.

STANDARD AND POWDERED

BENZALDEHYDE N.F. F.F.C.

TECHNICAL

Local Stocks

Manufactured by TENNESSEE PRODUCTS CORP. Plant at Chattanooga, Tenn.

MARKET OUTLOOK

Chemical Situation in 1944 Surveyed by WPB

Chemical Industry Plans Large Capital Outlay

Government Operation Fought by Fertilizer Industry

Critical Materials List Revised

United States Captures Dyestuffs Export Market

Continued Shortage of Coating Materials Predicted

Market Review

•

WPB Surveys Chemical Situation in 1944

Chairman Krug of the War Production Board reported recently to the President on the activities of the Board during 1944. All phases of the various programs were reported on, and an abstract of the portion dealing with chemicals provides an over-all survey of the market situation and trends during the past year.

Because of the virtual impossibility of determining end use of most chemicals, chemical controls imposed by the War Production Board during the war have for the most part been "M" orders, or restrictions on the use of raw materials. Few "L" orders, fixing limits on end products, have been issued. These raw material controls, together with production expansions in all of the critical chemicals, increased imports, and public purchase and stockpiling programs to cushion the shock of new or increased needs for chemicals resulted in bringing supply and demand into balance during the first half of 1944. There was, as a consequence, a tendency toward relaxation of controls where definable surpluses had appeared. The vigorous prosecution of the war in the fall, which resulted in a generally rising demand, checked the tendency toward relaxation or revocation of chemical control orders.

It was lack of materials, rather than lack of manpower, that was the chief limiting factor in chemicals during 1944. The manpower situation of the chemicals industry was in general more favorable than in most other industries, principally because the chemical industry was less susceptible to draft disruptions. There were some labor problems in the industry, due to the reluctance of workers to accept employment because of low wages or difficult working conditions, a factor which sometimes barred the employment of women. At the year end, labor shortage was preventing capacity operation of plants producing sodium, chromium chemicals, hydrofluoric acid, sulfuric acid, silica gel, naphthalene, carbon black, copper sulfate, vulcanized and fiber tubing, cotton linters, chlorinated paraffin, and carbon bisulfide.

The greatest chemicals problems resulted from the sharp increases in military requirements in the autumn of the year. The increase in the tire program, followed by an increase in the synthetic rubber program, resulted in a corresponding increase in requirements for carbon black which is essential to the compounding of rubber. An expansion program involving construction of 26 new plants was put into operation by the War Production Board. A limiting factor to the production of carbon black was the difficulty of obtaining labor in the Texas Panhandle.

Naphthalene is the raw material from which phthalic anhydride is made. From phthalic anhydride, in turn, are produced various plasticizers, such as dibutyl phthalate, used for smokeless powder; dimethyl phthalate, used primarily as an insect repellent; and dioctyl phthalate, used as a plasticizer in cable and wire insulation. Increased military requirements for all of these products necessitated, first, a careful screening of end-use requirements; second, construction of 6 new projects for phthalic anhydride; and third, construction of 10 new plants for naphthalene.

Increases in the explosives programs also made it necessary to set aside 80 percent of the total United States cotton linter production for chemical use.

The substitution of grain alcohol for petroleum in synthetic rubber production greatly increased requirements for ethyl alcohol, so that total requirements for ethyl alcohol were some 10.5 million gallons above the 1944 total supply of 604 million gallons. All essential needs were met by drawing from the stock pile of 86.6 million gallons. Raw materials for grain alcohol improved as the year progressed, with the exception of malt. To meet this deficiency, grain sorghums were made available, and high moisture corn was released to the distillers.

Perhaps the most amazing production stories of the war are those of penicillin and DDT. Penicillin reached a production total in 1944 almost 80 times that of 1943, and plant expansions planned in 1944 promise to boost this from an average rate of less than 150 billion units per month in 1944 to about 400 billion units per month in 1945. Civilian distribution was made possible on May 1, 1944.

The production record of DDT closely resembles that of penicillin. Output increased from 1,000 pounds per month in April 1943 to 200,000 pounds at the beginning of 1944, and to 2 million pounds per month at the end of the year. The greatly increased output of DDT was largely reserved for military use. The rise in DDT production was accompanied by a price decline of almost 60 percent.

Production of sulfa drugs declined by approximately 50 percent during 1944 as requirements fell off and the stock pile increased to a comfortable level. Production of atabrine was cut back in the last quarter of the year as 1944 military and lend-lease contracts approached completion; and in one instance an atabrine producer resumed production of dyestuffs.

Large Capital Outlay Planned by Industry

Industrial firms engaged in the manufacture of chemicals and allied products, products of petroleum and coal, and rubber products plan a capital outlay of $800,000,000 in the 12 months following victory in Europe, according to a survey made by the U. S. Department of Commerce. This is almost 2½ times as much as the $330,000,000 spent in 1939. It should be emphasized, however, that these are merely plans and not commitments.

Anticipated sales were also checked by the Department's questionnaire. It revealed that the same industry group expects an annual rate of sales, in from 12 to 18 months following V-E Day, in the neighborhood of $19 billion. This compares with annual sales in 1944 and 1939 of $22.6 billion and $10.9 billion respectively.

The over-all industrial outlay planned for plant, equipment, and alterations over the next twelve months is approximately $4.5 billion. This is nearly 3 times the 1937-1940 average, and more than half again as large as in 1929.

Fertilizer Industry Fights Govt. Operation

Leaders of the fertilizer industry banded together recently to fight pressure exerted in some quarters to promote government operation of fertilizer plants after the war. Organization for concerted action was accomplished by formation of the American Plant Food Council, whose stated objective is to achieve a more abundant and economical production and distribution of fertilizers "by keeping the ownership and operation of such facilities in the hands of private enterprise."

Affairs of the council, membership in which is open to all members of the fertilizer industry, will be administered by

a paid president and conducted from headquarters in Washington.

The council will promote its objectives by fostering better relations among the industry, the Government, and the public; by disseminating information on the necessity of maintaining a competitive industry; by providing an educational service, directed to farmers, on the proper utilization of fertilizers; and by cooperating with various Federal and State Government units in conducting experiments, studies, and surveys.

The ultimate solution of the major problem on the agenda of the council will, it goes without saying, have a tremendous influence on the future of fertilizer markets.

Revised Critical Materials List

A revised list of critical chemical materials and products was submitted to the War Production Board recently by the Joint Committee on Critical Materials and Products.

Critical materials and products are defined as those which are now, or expected to be, in short supply and which threaten to limit the production of essential products or the fulfillment of programs of high urgency.

Changing conditions of supply and demand necessitate the revision of the list from time to time, WPB said.

The revised list follows:

Antimony
Benzene
Benzyl Benzoate
Bismuth
Cadmium
Columbium
Corundum Primary Grain
Cotton Linters
Cresols and Cresylic Acid
Emetine
Film, X-Ray
Gasoline, Aviation
Glass, Fibrous, Type "A" fiber
Glass, Fibrous, Type XAA-PF insulation
Hydrogen Peroxide
Iron Oxide (Yellow precipitate)
Laboratory Equipment
Lead
Naphthalene
Naphthenic Acid
Neoprene
Nicotine Sulphate
Nylon
Oil, Crude
Paper, Waterproof (Asphalt laminated)
Petroleum Distillates (Military and essential civilian)
Petroleum Sulfonates (Refined, oil soluble)
Platinum
Phthalic Anhydride
Pulpwood
Quinacrine (Atabrine)
Quinidine
Rosin
Rubber, Natural and Latex
Rubber, Scrap
Sodium Bichromate
Talc, Fibrous
Tape, D. R., Waterproof Rubber Insulated (Signal Corps Specification TL-192)
Tin
Wax, Microcrystalline
Wax, Paraffin
Woodpulp, Sulphate

U. S. Role Greater In Dyestuffs Market

That the productive capacity of the American dyestuffs industry has increased so greatly in the past few years that the United States will doubtless play a more important role in the world dyestuffs market is the contention of George W. Burpee, president of General Aniline & Film Corporation.

Despite the unprecedented demands of our own military forces and our domestic industry, American producers are supplying more dyestuffs to Canada, Latin America, and other friendly nations. The end of the European war and the subsequent rehabilitation of European industry will undoubtedly require large amounts of these materials from this nation.

Exports from the United States to India and Latin America have increased greatly during the war, and China will again be a large consumer when trade can be resumed. It would appear that for a long time to come the United States will be able to hold foreign markets wrested away from European producers.

WPB Predicts Continued Protective Coatings Shortage

All types of paints, varnishes and lacquers will continue in short supply for the duration of the war in the Pacific, the Chemicals Bureau of the War Production Board has emphasized.

Baked or forced-drying synthetic enamels and lacquers required for coating production line items are in barely sufficient supply to meet current military requirements, WPB said. However, the agency pointed out, the supply of these quick-drying finishes is slowly improving and it is believed that by the fourth quarter requirements for certain highly essential civilian reconversion programs such as the new domestic mechanical refrigerator and washing machine programs can be met.

The shortage of protective coatings for production line items results from critical shortages of basic raw materials, including phthalic alkyd resins, chemical plasticizers, butyl alcohol, butyl acetate, and toluene range aromatic solvents. The governing raw material in most cases is phthalic alkyd resins, for which no adequate substitute is available.

Market Review

Heavy Chemicals.—Importations of sal ammoniac may materially relieve the pressure of demand for the domestic material. The alkali market is at present stronger than at any previous time during the war; this applies as well to caustic potash. A 10 per cent increase in domestic rayon shipments during the first half of the year accounts in part for the present acute shortage of caustic soda, and the 4-day strike at Solvay's Syracuse plant intensified the situation. New as well as old uses for calcium chloride are expected to maintain the heavy demand; the supply is not adequate for all requests. Production of carbon bisulfide is sold well ahead. Stocks of copper sulfate are at a very low point, but easing of agricultural demands will make it possible for producers to build up inventories. Alkali phosphates continue scarce. Supplies of soap fats are expected to continue short throughout 1945.

Fine Chemicals.—Contrary to the general supply situation in tartrates, large stocks of cream of tartar and tartaric acid are reported on hand for spot delivery by Edward Remus & Co., New York. Demand for glycerin is heavy, leading to a shrinkage of stocks, recent action by the WFA restricting inventories, and a rise in price. Oxalic, citric, and formic acids and hydrogen peroxide are not readily available. The sugar shortage has led to a greater demand for glucose and saccharin. High methanol demands are reflected in a continued shortage of formaldehyde. Seasonal requirements have reduced sodium benzoate stocks. There is more carbon tetrachloride available at present than at any time previously this year. One producer has reduced the price of riboflavin 25 per cent. Butyl alcohol and acetate, which declined in price recently, rose again on July 1. The alcohol was up ½¢ per lb. Coumarin and vanillin supplies are inadequate to meet demands, as is also true of paradichlorobenzene and thymol. Brazilian menthol is still declining in price, s is mercury metal. Mercurial derivatives finally followed the downward trend of the parent metal, the major ones declining about 5 per cent. Scarcity of some sulfa drugs has resulted in small lots being resold at 20 to 30 per cent premiums. Importation difficulties from Brazil have virtually eliminated supplies of carnauba wax. Acetone, whose supply situation is spotty, was reduced 1¢ per lb.

Paint Materials.—Allocations of chrome pigments were only 60 per cent of quota in July because of the continued shortage of sodium bichromate. The large demand for castor oil has made allocation control by WFA necessary.

Agricultural Chemicals.—Rumors pointing to the relaxation of nitrogen controls in September have given rise to optimism concerning nitrogen fertilizers. Insecticide and fungicide supplies are somewhat improved. Although rotenone remains critical, pyrethrum, arsenicals, cryolite, some sulfur compounds, and mercurials are somewhat improved.

The Bureau of Mines has prepared a valuable survey of trends in consumption and prices of chemical raw materials and fertilizers between 1910 and 1943.

A copy of the report may be obtained by writing to the Bureau of Mines, Department of the Interior, Washington 25, D. C., for Information Circular 7320, "Trends in Consumption and Prices of Chemical Raw Materials and Fertilizers," by Dr. Oliver Bowles, Chief of the Nonmetal Economics Division, Bureau of Mines.

Wanted

Chemicals

for

Switzerland

•

The SWISS market requires large quantities of Chemicals, Solvents and Pharmaceuticals.

Our excellent and old standing connections with the SWISS industries are at your disposal.

We are willing to act as selling agents of first class manufacturers for Switzerland, or buy on firm account.

Please write or cable to:

•

Schweizerhall *Ltd*

Basle 13 (*Switzerland*)

Founded 1860

Share Capital & Reserves: Swiss francs 4.000.000.—

Telegrams: "Schweizerhall Basle"

References:

Swiss Bank Corporation, 15 Nassau Street, New York

CURRENT PRICES

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 July, 1943, $0.903 July, 1944, $0.890 July, 1945, $0.864

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Acetaldehyde,99%,drs.wks. lb.	.11	.14	.11	.14	.11	.14
Acetic Anhydride, drs, ...lb.	.11½	.13	.11½	.13	.11½	.13
Acetone, tks, delv. .....lb.	.06	.07	...	.07	...	.07
ACIDS						
Acetic, 28%, bbls ....100 lbs.	3.38	3.63	3.38	3.63	3.38	3.63
glacial, bbls. .....100 lbs.	9.15	9.40	9.15	9.40	9.15	9.40
tks, wks. .....100 lbs.	6.93	7.25	6.93	7.25	...	6.93
Acetylsalicylic, Standard USP .....lb.	.40	.54	.40	.54	.40	.54
Benzoic, tech. bbls. .....lb.	.43	.47	.39	.47	.39	.47
USP, bbls, 4,000 lbs. up lb.	...	.54	...	.54	...	.54
Boric tech, bbls, c-l....tons *a*	...	109.00	...	109.00	...	109.00
Chlorosulfonic, drs, wks. ..lb.	.03	.04½	.03	.04½	.03	.04½
Citric, USP, crys, gran, bbls. .....lb. *b*	.20	.21	.20	.21	.20	.24
Cresylic 50%, 210-215° HB, drs. wks. frt. equal gal.	.81	.83	.81	.83	.81	.83
Formic, 85%-90% cbys...lb.	.10	.11½	.10	.11½	.10½	.11½
Hydrofluoric, 30% rubber, dms. .....lbs.	.08	.09	.08	.09	.08	.09
Lactic, 22%, lgt, bbls wks lb.	.039	.0415	.039	.0415	.039	.0415
44%, light, bbls wks ...lb.	.073	.0755	.073	.0755	.073	.0755
Maleic, Anhydride, drs ..lb.	.25	.26	.25	.26	.25	.26
Muriatic, 18° cbys ...100 lb.	1.50	2.45	1.50	2.45	1.50	2.45
20° cbys, c-l, wks. ...100 lb.	...	1.75	...	1.75	...	1.75
22° cbys, c-l, wks ..100 lb.	...	2.25	...	2.25	...	2.25
Nitric,36°,cbys, wks 100 lbs. *c*	5.00	5.25	5.00	5.25	5.00	5.25
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	...	5.50	...	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	...	6.50	...	6.50
Oxalic, bbls, wks .....lb.	.11¼	.12½	.11¼	.12½	.11¼	.12½
Phosphoric, 100 lb. cbys, USP .....lb.	.10½	.13	.10½	.13	.10½	.13
Salicylic, tech, bbls .....lb.	.26	.42	.26	.42	.26	.44
Sulfuric, 60°, tks, wks ..ton	...	13.00	...	13.00	...	13.00
66°, tks, wks .....ton	...	16.50	...	16.50	...	16.50
Fuming 20% tks, wks..ton	...	19.50	...	19.50	...	19.50
Tartaric, USP, bbls .....lb.	.70½	.71	.70½	.71	...	.70½
Alcohol, Amyl (from Pentane) tks, delv .....lb.	...	.131	...	.131	...	.141
Butyl, normal, syn, tks lb.	...	.10¾	...	.10¾	.10¾	14.¼
Denatured, CD 14, c-l drs .....gal. *d*	...	.57	...	.57	...	.54½
Denatured, SD, No. 1, tks.*d*	...	.50	...	.50	...	.50
Ethyl, 190 proof tks...gal.	...	17.60	...	17.60	...	11.90
Isobutyl, ref'd, drs ....lb.	...	.086	...	.086	...	.086
Isopropyl ref'd, 91%, dms .....gal.	.38	.41	.37½	.66½	.39	.66½
Alum, ammonia, lump, bbls, wks .....100 lb.	...	4.25	...	4.25	...	4.25
Aluminum, 98-99% ...100 lb.	15.00	16.00	15.00	16.00	15.00	16.00
Chloride anhyd l.c.l. wks lb.	.09	.12	.08	.12	.08	.12
Hydrate, light, bgs. ....lb.	...	.14½	...	.14½	.14½	.15
Sulfate, com'l. bgs, wks, c-l .....100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
Sulfate, iron-free, bgs. wks .....100 lb.	1.85	2.10	1.85	2.50	1.75	2.50
Ammonia anhyd, cyl .....lb.	...	.14½	...	.14½	...	.16
Ammonium Carbonate, USP, lumps, dms ..lb.	.08¼	.09¼	.08½	.09¼	.08¼	.09¼
Chloride,whi,bbls,wks,100 lb.	4.45	5.15	4.45	5.15	4.45	5.15
Nitrate, tech. bags, wks. lb.	.0435	.0850	.0435	.0850	.0435	.0850
Oxalate pure, grn. bbls. lb.	...	.23	.27	.33	.27	.33
Perchlorate, kgs .....lb.	No stocks		.55	.65	.55	.65
Phosphate, dibasic tech. bgs .....lb.	.07	.07¾	.07	.07¾	.07¼	.08½
Stearate, anhyd. dms....lb.	...	.34	...	.34	...	.34
Sulfate, dms, bulk ....ton	28.20	29.20	28.20	29.20	28.20	30.00
Amyl Acetate (from pentane) c-l, drs, delv .....lb.	...	.15½	...	.15½	...	.15¼
Aniline Oil, drs .....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Anthraquinone, sub, bbls...lb.	...	.70	...	.70	...	.70
Antimony Oxide, bgs .....lb.	.15	.15½	.15	.15½	.15	.15¼
Arsenic, whi, kgs—powd. lb.	.04	.04¾	.04	.04¾	.04	.04¾

USP $25 higher; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal; *c* Yellow grades 25c per 100 lbs less in each case; *d* Prices given are Eastern schedule. *a* Powdered boric acid $5 a ton higher; *b* Powdered citric acid is ½c higher.

	Current Market	1944 Low	1944 High	1943 Low	1943 High
Barium Carbonate precip, wks, bgs. ton	60.00	75.00	55.00	75.00	55.00	65.00
Chloride, tech, cyst, bgs, zone 1 ton	73.00	78.00	73.00	90.00	77.00	90.00
Barytes, floated, bbls. ton	...	36.00	...	36.00	...	36.00
Bauxite, bulk mines ton	7.00	10.00	7.00	10.00	7.00	10.00
Benzaldehyde,tech,cbys,dms lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, tks, ft all'd gal.	...	.15	...	.15	...	.15
Benzyl Chloride, cbys lb.	.22	.24	.22	.28	.22	.25
Beta-Naphthol, tech, bbls, wks ton	.23	.24	.23	.24	.23	.24
Bismuth metal, ton lots lb.	...	1.25	...	1.25	...	1.25
Blanc Fixe, 66⅔% Pulp, bbls, wks ton *h*	40.00	46.50	40.00	46.50	40.00	46.50
Bleaching Powder, wks,100 lb.	2.50	3.60	2.50	3.60	2.50	3.60
Borax, tech, c-l, bgs ton *i*	...	45.00	...	45.00	...	45.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases lb.	.21	.23	.21	.30	.25	.30
Butyl, acetate, norm. drs. lb.	.1860	.1910	.1755	.1945	.1575	.1840
Cadmium Metal lb.	.90	.95	.90	.95	.90	.95
Calcium, Acetate, bgs, 100 lb.	3.00	4.00	3.00	4.00	3.00	4.00
Carbide, drs ton	50.00	90.00	50.00	95.00	50.00	95.00
Carbonate, c-l bgs ton	18.00	22.00	18.00	22.00	18.00	22.00
Chloride, flake, bgs c-l ton	18.50	35.00	18.50	35.00	18.50	35.00
Solid, 73-75% drs, c-l, ton	18.00	34.50	18.00	34.50	18.00	31.50
Gluconate, U.S.P., drs. lb.	.57	.59	.57	.59	.57	.58
Phosphate, tri, bbls, cl. lb.	...	.0635	.0635	.0785	.0635	.0785
Camphor, U.S.P., gran, powd, bbls lb.	.69	.71	.68½	.71	.68½	.70½
Carbon Bisulfide, 55-gal drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Dioxide, cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, Zone 1, 52½ gal. drms lb.	.78	.80	.73	.80	.73	.80
Casein, Acid Precip, bgs, 100 or more lb.	.22	.24	...	.24	...	.24
Chlorine, cyls, lcl, wks, contract lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract lb. *j*	...	.05¼	...	.05¼	...	.05¼
Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Chloroform, tech, drs lb.	.20	.23	.20	.23	.20	.23
Coal tar, bbls, crude bbl.	8.25	8.75	8.25	8.75	8.25	8.75
Cobalt, Acetate, bbl lb.	...	.83¾	...	.83¾	...	.83¾
Oxide, black kgs lb.	...	1.84	...	1.84	...	1.84
Copper, metal 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Carbonate, 52-54%, bbls. lb.	.19½	.20½	.19½	.20½	.19½	.20½
Sulfate, bgs, wks cryst. 100 lb.	5.00	5.50	5.00	5.50	5.00	5.50
Copperas, bulk, c-l, wks ton	...	14.00	...	14.00	...	14.00
Cresol, USP, drs lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.11¾
Cyanamid, bgs ton	1.52½	1.62½	1.52½	1.62½	1.52½	1.62½
Dibutylamine, c-l, drs, wks, 100% basis lb.	...	.66	...	.66	...	.66
Dibutylphthalate, drs lb.	.2100	.2409	.1780	.2659	.2060	.2300
Diethylaniline, lb drs lb.	...	.40	...	.40	...	.40
Diethyleneglycol, drs, wks lb.	.14	.15	.14	.15½	.14	.15½
Dimethylaniline, dms,cl.,lcl lb.	.21	.22	.21	.24	.23	.24
Dimethyl phthalate, drs lb.	.1875	.1925	.1875	.1925	.1875	.2050
Dinitrobenzene, bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, dms. lb.	...	.14	...	.14	...	.14
Dinitrophenol, bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, dms lb.	...	.18	...	.18	...	.18
Diphenyl, bbls lcl. wks lb.	.16	.20	.16	.20	.15	.20
Diphenylamine bbls lb.	...	.25	...	.25	...	.25
Diphenylguanidine, drs lb.	.35	.37	...	.35	.35	.37
Ethyl Acetate, tks, frt all'd lb.	.1070	.1175	.1070	.1175	.107	.110
Chloride, drs lb.	.18	.20	.18	.20	.18	.20
Ethylene Dichloride, lcl. wks, E. Rockies, dms lb.	.0842	.0941	.0842	.0941	...	.0842
Glycol, dms, cl. lb.	...	.10	...	.10	...	.10
Fluorspar, No. 1, grd.95-98% bulk, cl-mines ton	...	37.00	...	37.00	...	37.00
Formaldehyde, bbls, cl & lcl lb.	.0520	.0570	.0520	.0570	.0550	.0575
Furfural tech, dms, c-l,wks lb.	...	.13	...	.13	...	.12½
Fusel Oil, ref'd, dms, dlvd lb.	.18½	.19½	.18½	.19½	.18½	.19½
Glauber's Salt, Cryst, c-l, bgs, bbls, wks 100 lb.	1.05	1.45	1.05	1.25	1.05	1.25
Glycerin dynamite, dms, c-l, lb.	...	16½	...	.14½	...	.18¾
Crude Saponification, 80% to refiners tks lbs.	...	.11⅛	.09½	.10	...	.12¾

GUMS

Gum Arabic, amber sorts bgs lb.	.12	.12¼	.11¾	.14	.13½	.17½
Benzoin Sumatra, CS lb.	.52	1.00	.52	1.00	.52	1.00
Copal, Congo lb.	...	.55¾	...	.55¾	...	.55¾
Copal, East India, chips lb.	...	.5¾	...	...	...	...
Macassar dust lb.	...	.07⅜	...	.07⅜	.07⅜	.11¾
Copal Manila,	.13½	.15½	.13½	.15½	.13½	.15½
Copal Pontianak, bold c-l lb.	...	.23⅜	...	.23⅜	...	.23⅜
Karaya, bbls, bxs, dms. lb.	.15	.46	.15	.46	.14	.40

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; rened. ref'd; tanks, tks; works, f.o.b., wks.

y Price given is per gal.

Whether the formula is your specification or whether you tell us only what results you want to obtain, ARCC's stable, uniform, controlled-viscosity, low-cost emulsions will satisfy your requirements in compounding

Buna • Neoprene • Hycar

Latices

Write today for the ARCC Technical Data Book on Resin Colloids

Adhesives, Coatings, Laminants, Impregnants, Emulsion Polymers, Thermosetting Resins, Thermoplastic Resins.

Acrylics — Alkyds — Amides — Cellulose Derivatives — Maleics — Phenolics — Styrenes — Vinyls.

American Resinous Chemicals Corp.

HOME OFFICES AND LABORATORIES: PEABODY, MASS.
NEWARK, N. J. CHICAGO, ILL. MONROVIA, CALIF.

ACETATE SALTS

COPPER - ZINC

POTASSIUM - SODIUM

MAGNESIUM - MANGANESE

••

For further information write to

NIACET
CHEMICALS DIVISION
UNITED STATES VANADIUM CORPORATION
Unit of Union Carbide and Carbon Corporation
Sales Offices
922 Niagara Building • Niagara Falls, N. Y.

Ready to Serve—

Aqua Ammonia
Anhydrous Ammonia
Yellow Prussiate of Soda
Calcium Ferrocyanide
Calcium Chloride
Tri-Sodium Phosphate

●

HENRY BOWER CHEMICAL
MANUFACTURING COMPANY
29th & GRAY'S FERRY ROAD PHILADELPHIA, PA.

STEARATES

ZINC STEARATE
CALCIUM STEARATE
ALUMINUM STEARATE
MAGNESIUM STEARATE

Stocks at

NEW YORK ST. LOUIS DALLAS SAN FRANCISCO
CHICAGO KANSAS CITY LOS ANGELES SEATTLE

FRANKS CHEMICAL PRODUCTS CO.
BLDG. 3, BUSH TERMINAL — BROOKLYN, N.Y.

Current Prices

Gums
Salt Cake

		Current Market	1944 Low	1944 High	1943 Low	1943 High
Kauri, N. Y.						
Superior Pale XXX	lb.	...	.65¾	...	.65¾	...	.65¼
No. 3	lb.	...	.22	...	.23	...	.22
Sandarac, cs	lb.	...	.99½	...	.99½	1.40	nom.
Tragacanth, No. 1, cases	lb.	4.00	4.10	4.00	5.25	4.00	5.25
No. 3	lb.	2.25	2.50	1.10	3.50	1.10	1.20
Yacca, bgs	lb.	.06	.07¼	.06	.07¼	.06	.07¼
Hydrogen Peroxide, cbys	lb.	.15½	.18½	.15½	.18½	.15½	.18½
Iodine, Resublimed, jars	lb.	2.00	2.10	2.00	2.10	2.00	2.10
Lead Acetate, cryst, bbls.	lb.	...	.12½	...	.12½	...	.12½
Arsenate basic, bg, lcl	lb.	.11½	.12	.11½	.12	.11½	.12
Nitrate, bbls.	lb.	...	.12½	...	.12½	...	.12½
Red, dry, 95% Pb_3O_4 bbls.	lb.	.09	.10¾	.09	.11	.09	.11
97% Pb_3O_4, bbls delv	lb.	.09½	.11	.09½	.11	.09¼	.11
98% Pb_3O_4, bbls delv	lb.	.09½	.11¼	.09½	.11¼	.09½	.11¼
White, bbls	lb.	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
Basic sulfate, bbls, lcl	lb.	.07¼	.08	.07¼	.08	.07¼	.08
Lime, Chem., wks, bulk	ton	6.25	13.00	6.25	13.00	6.25	13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	16.00
Litharge, coml, delv, bbls.	lb.	.08	.09¾	.08	.09¾	.08	.09¾
Lithopone, ordi., bgs	lb.	.04¼	.04½	.04¼	.04¾	.04¼	.04¾
Magnesium Carb, tech, wks	lb.	.06¼	.09¾	.06¼	.09¾	.06¼	.09¼
Chloride flake, bbls, wks c-l	ton	...	32.00	...	32.00	...	32.00
Manganese, Chloride, Anhyd. bbls	lb.	.15	.18	.15	.18	.14	nom.
Dioxide, Caucasian bgs, lcl	ton	74.75	79.75	...	74.75	...	74.75
Methanol, pure, nat, drs gal *l*		.63	.76	.63	.76	.63	.76
Synth, drs cl gal. *m*		.31	.38	.31	.40½	.34½	.40½
Methyl Acetate, tech tks	lb.	.06	.07	.06	.07	.06	.07
C.P. 97-99%, tks, delv	lb.	.09½	.10½	.09½	.10½	.09½	.10½
Chloride, cyl	lb.	.32	.40	.32	.40	.31	.40
Ethyl Ketone,tks,frt all'd	lb.	...	.08	...	.08	...	.08
Naphtha, Solvent, tks	gal.	...	.27	...	.27	...	.27
Naphthalene, crude, 74°, wks tks	lb.	...	.0275	...	.0275	...	.0275
Nickel Salt, bbls, NY	lb.	.13	.13½	.13	.13½	.13	.13½
Nitre Cake, blk	ton	...	16.00	...	16.00	...	16.00
Nitrobenzene, drs, wks	lb.	.08	.09	.08	.09	.08	.09
Orthoanisidine, bbls	lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs	lb.	.25	.27	.25	.32	...	.32
Orthodichlorobenzene, drms	lb.	.07	.08	.07	.08	.07	.08
Orthonitrochlorobenzene, wks	lb.	.15	.18	.15	.18	.15	.18
Orthonitrotoluene, wks,dms	lb.	...	.09	...	.09	...	.09
Paraldehyde, 98%, wks lcl	lb.	...	.12	...	.12	...	.12
Chlorophenol, drs.	lb.	.26½	.28	.25	.32	...	.32
Dichlorobenzene, wks	lb.	.11	.15	.11	.15	.11	.15
Formaldehyde, drs, wks	lb.	.21	.22	.23	.24	.23	.24
Nitroaniline, wks, kgs	lb.	.43	.45	.43	.45	.43	.45
Nitrochlorobenzene, wks	lb.	...	.15	...	.15	...	.15
Toluenesulfonamide, bbls	lb.	...	.70	...	.70	...	.70
Toluidine, bls, wks	lb.	...	.48	...	.48	...	.48
Penicillin, ampules per 100,000 units		...	.70	.95	4.50	...	...
Pentaerythritol, tech	lb.	.29	.33	.29	.33	.29	.35½

PETROLEUM SOLVENTS AND DILUENTS

Lacquer diluents, tks, East Coast	gal.	...	.11½	...	.11½	...	.11
Naphtha, V.M.P., East tks, wks	gal.	...	.11	...	.11	...	.11
Rubber solvents, East, tks, wks	gal.	...	.11	...	.11	...	.11
Stoddard Solvents, East, tks, wks	gal.	...	.10	...	.10	...	.09½
Phenol, U.S.P., drs	lb.	.10½	.11¼	.10½	.11¼	.10½	.13¼
Phthalic Anhydride, cl and lcl, wks	lb.	.13	.14	.13	.14	.13	.15½
Potash, Caustics, 88-92%, wks, sol.	lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake, 88-92%	lb.	.07	.07½	.07	.07½	.07	.07½
liquid, 45% basis, tks	lb.	...	.02⅞	...	.02¾	...	.0275
dms, wks	lb.	.03⅛	.03½	.03	.03½	.03	.03½
Carbonate, hydrated 83-85%	lb.	...	.05½	.05½	.05¾	.05½	.05¾
Chlorate crys, bgs, wks	lb.	.11	.13	.11	.13	.11	.13
Chloride, crys, tech, bgs, kgs	lb.	.08	nom.	.08	nom.	.08	nom.
Cyanide, drs, wks	lb.	...	.55	...	.55	...	.55
Iodide, bots., or cans	lb.	1.44	1.48	1.44	1.48	1.44	1.48
Muriate, dom, 60-62-63% K_2O bulk unit-ton	ton	...	.53½	...	.53½	.53½	.56
Permanganate, USP, wks dms	lb.	.20½	.21	.20½	.21	.20½	.21
Sulfate, 90%, basis, bgs	ton	...	36.25	...	36.25	...	36.25
Propane, group 3, tks	gal.	...	.03¾	...	.03¾	...	.03¾
Pyridine, ref., drms	lb.	.45	.45½	.45	.46	.45½	.46
R Salt, 250 lb bbls, wks	lb.	...	.65	...	.65	...	.65
Resorcinol, tech, drms, wks	lb.	.68	.75	.68	.75	.68	.75
Rochelle Salt, cryst	lb.	.43½	.47	.43½	.47	.43½	.47
Salt Cake, dom, blk wks	ton	...	15.00	...	15.00	...	15.00

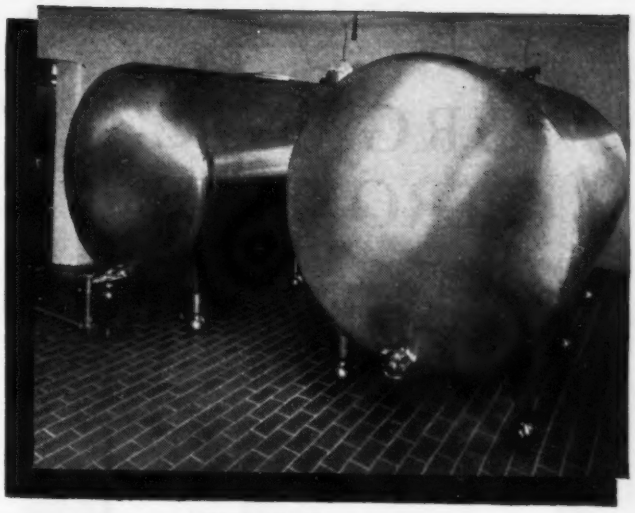
l Producers of natural methanol divided into two groups and prices vary for these two divisions; *m* Country is divided in 4 zones, prices varying by zone.
* Spot price is ½c higher.

		Current Market		1944 Low	1944 High	1943 Low	1943 High
Saltpetre, grn, bbls	100 lb.	8.20	8.60	8.20	8.60	8.20	8.60
Shellac, Bone dry, bbls	lb. *r*	.42½	.46	.42½	.46	.42½	.46
Silver Nitrate, 100 oz, bots	oz.	...	.32⅜	...	.32⅜	...	.32⅜
Soda Ash, 58% dense, bgs, c-l, wks	100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs cl	100 lb.	1.05	1.13	1.05	1.13	...	1.13
Caustic, 76% flake drms, cl	100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drms,cl	100 lb.	...	2.30	...	2.30	...	2.30
Liquid, 47-49%, sellers, tks	100 lb.	...	1.95	...	1.95	...	1.95
Sodium Acetate, anhyd. dms	lb.	.08½	.10	.05	.10	.05	.06
Benzoate, USP dms	lb.	.46	.52	.46	.52	.46	.52
Bicarb, tech., bgs., cl., works	100 lb.	1.55	1.90	1.55	2.05	...	...
Bichromate, bgs,wks l.c.l.	lb.	.07⅞	.08⅛	.07⅞	.08⅛	...	.07¾
Bislfite powd, bbls, wks	100 lb.	3.00	3.60	3.00	3.60	3.00	3.60
35° bbls., wks	100 lb.	1.40	1.65	1.40	1.65	1.40	1.65
Chlorate, kgs, wks c.l.	lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, wks	lb.	.14½	.15	.14½	.15	.14½	.15
Fluoride, 95%, bbls, wks	lb.	.07¼	.08¼	.07¼	.08¼	.07¼	.08¼
Hyposulfite, cryst, bgs, cl, wks	100 lb.	...	2.25	...	2.25	...	2.25
Metasilicate, gran, bbl, wks c-l	lb.	...	2.50	...	2.50	...	2.50
Nitrate, imp, bgs	ton	...	33.00	...	33.00	...	33.00
Nitrite, 96-98% bbl. cl.	lb.	...	.06¾	...	.06¾	...	.06¾
Phosphate, di anhyd. bgs. wks.	100 lb.	6.00	7.25	6.00	7.25	6.00	7.25
Tri-bgs, cryst, wks	100 lb.	2.70	3.40	2.70	3.40	2.70	3.45
Prussiate, yel, bbls. wks	lb.	...	.11	.10	.11	.10	.11
Silicate, 52°,drs,wks	100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
40°, drs, wks, c-l	100 lb.	...	.80	...	.80	...	.80
Silicofluoride, bbls NY	lb.	.06½	.10	.06½	.12	.05	.12
Sulfate tech. Anhyd. bgs	100 lb.	1.70	2.20	1.70	1.90	1.70	1.90
Sulfide, cryst c-l, bbls, wks	100 lb.	...	2.40	...	2.40	...	2.40
Solid, bbls, wks	lb.	3.15	3.90	3.15	3.90	3.15	3.90
Starch, Corn, Pearl, bgs	100 lb.	...	4.08	...	4.08	...	3.47
Potato, bgs, cl	lb.	...	.0637	...	.0637	...	.0637
Rice, bgs	lb.	no stocks		no stocks		.09½	.10¼
Sweet Potato, bgs	lb.	.09	.09¼	.07½	.09¼	...	.07½
Sulfur, crude, mines	ton	...	16.00	...	16.00	...	16.00
Flour, USP, precp, bbls, kgs	lb.	.18	.30	.18	.30	.18	.30
Roll, bbls	100 lb.	2.40	2.90	2.40	2.90	2.40	2.90
Sulfur Dioxide, liquid, cyl	lb.	.07	.08¼	.07	.09	.07	.08
tks, wks	lb.	...	.04	.04	.06	.04	.06
Talc, crude, c-l, NY	ton	...	13.00	...	13.00	...	13.00
Ref'd, c-l, NY	ton	13.00	21.00	13.00	21.00	13.00	21.00
Tin, crystals, bbls, wks	lb.	no stocks		no stocks		no stocks	
Metal	lb.	...	.52	...	.52	...	.52
Toluol, drs, wks	gal.	...	.33	...	.34½	...	.33
tks, frt all'd	gal.	...	.28	...	.28	...	.28
Tributyl Phosphate, dms lcl, frt all'd	lb.	...	.49	...	.49	...	.47
Trichlorethylene, dms, wks	lb.	.08	.09	.08	.09	.08	.09
Tricresyl phosphate tks.	lb.	...	.24	...	.24	...	...
Triethylene glycol, dms	lb.	.18½	.19½	.18½	.26	...	.26
Triphenyl Phos, bbls	lb.	.31	.32	.31	.32	.31	.32
Urea, pure, cases	lb.	...	.12	...	.12	...	.12
Wax, Bayberry, bgs	lb.	no stocks		.25	nom.	.25	.26
Bees, bleached, cakes	lb.	...	.60	...	.60	...	.60
Candelilla, bgs crude	ton	...	.38	.34½	.48	.38	.48
Carnauba, No. 1, yellow, bgs, ton	lb.	...	.83¼	...	.83¼	...	.83¼
Xylol, Indus. frt all'd, tks, wks	gal.	...	.27	...	.27	...	.27
Zinc Chloride tech fused, wks	lb.	.05	.0535	.05	.0535	.05	.0535
Oxide, Amer, bgs, wks	lb.	.07¼	.07½	.07	.07½	.07	.07½
Sulfate, crys, bgs	100 lb.	3.40	4.15	3.40	4.35	3.60	4.35

OILS AND FATS

Babassu, tks, futures	lb.	...	.111	...	.111	...	.111
Castor, No. 3, bbls	lb.	.13¾	.14¼	.13¾	.14¼	.13¾	.14¼
China Wood, drs, spot NY	lb.	.39	.41	.39	.41	...	.39
Coconut, edible, drs NY	lb.	...	.0985	...	.0985	...	.0985
Cod Newfoundland, dms	gal.	.85	.88	.85	.90	...	.90
Corn, crude, tks, wks	lb.	...	.12¾	...	.12¾	...	.12¾
Linseed, Raw, dms, c-l	lb.	...	.1550	.1510	.1560	...	.1530
Menhaden, tks		...	.1225	...	.1225	...	.1225
Light, pressed, drs l.c.l.	lb.	...	.1300	...	.1200	.1305	.1307
Palm, Niger, dms	lb.	...	.0865	...	.0865	...	.0865
Peanut, crude, tks, f.o.b. wks	lb.	.12⅞	.13⅞	.12⅞	.13⅞	...	.18
Perilla, crude dms, NY	lb.	no stocks		...	.245	...	.245
Rapeseed, New Orleans, bulks	lb.	...	.1156½	...	.1156½	...	.1150
Red, dms	lb.	.13¼	.14¼	.13¼	.14¼	...	...
Soy Bean, crude, tks, wks	lb.	...	.1175	...	.1175	...	.1175
Tallow, acidless, bbls	lb.	...	.14¼	...	.14¼	...	.14¼

r Bone dry prices at Chicago 1c higher: Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b N. Y., refined 6c higher in each case.



The John Van Range Co.

Specializing in Fabrication of

STAINLESS STEEL EQUIPMENT

for the

Chemical and Processing Industries

Also manufacturers of Monel Metal, Aluminum, Copper, Zinc and Steel Equipment. Founded in 1847, our Experience should be invaluable to Manufacturing Chemists, Food, Dairy, Drug and Textile Processing Industries.

CONSULT US ON YOUR PROBLEMS

SEND US YOUR INQUIRIES

The John Van Range Co.

EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD

Division of The Edwards Manufacturing Co.

307-347 CULVERT ST. CINCINNATI 2, OHIO

ORGANIC PEROXIDES

CATALYSTS FOR POLYMERIZATIONS
DRYING ACCELERATORS · OXIDATION AGENTS · BLEACHING AGENTS

LUCIDOL®
(BENZOYL PEROXIDE)

LUPERCO®
(PEROXIDE COMPOUNDS)

ALPEROX® C
(TECHNICAL LAUROYL PEROXIDE)

LUPEROX®
(PEROXIDE PASTES)

Special Organic Peroxides

® REGISTERED TRADEMARK

TRADE MARK

LUCIDOL CORPORATION

BUFFALO (5) N. Y.

BECCO
ACETYL PEROXIDE
May be the Catalyst you have been looking for!

1 High Polymerizing activity

2 Crystal clear liquid

3 High monomer solubility

4 Insensitive to shock

Acetyl Peroxide
PROPERTIES

1 Acetyl peroxide content 30% by weight
2 4% active oxygen by weight
3 Specific gravity 1.18
4 Flash point 45° C. (open cup method)
5 Soluble in common organic solvents and monomers

Available in laboratory samples. Write to:

Buffalo Electro-Chemical Company, Inc.
SALES AGENT—BECCO SALES CORPORATION
Buffalo 7, New York

GUMS

TRAGACANTH KARAYA ARABIC
QUINCE SEED NUTGALLS

D. S. DALLAL & CO.

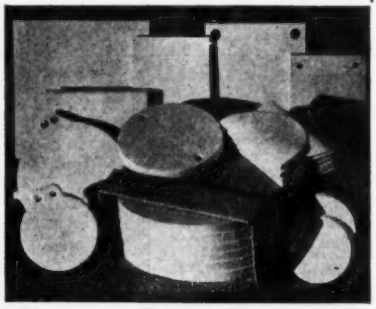
261 FIFTH AVENUE, NEW YORK 16
IMPORT Direct Importers **EXPORT**

TELEPHONE MURRAY HILL 3-8646 - 8647 - 8648

. . . for BATCH CONTROL that NEVER Varies

Rely on "Engineered" Filco Filter Papers to deliver a consistently uniform filtrate in processing chemicals from the raw state to the finished product! Any Filter Paper order will be designed to fit your specific need and equipment. Write for FREE working samples.

Specialists in:
Filter Paper, Cloth, Asbestos Fibre Pads, and filter aids. Filter Presses, Pumps, Stainless Storage and Mixing Tanks; Easy-Ride Gravity Conveyors, Wadding for protective packaging, and Paper Wipes.



FILCO BRAND

THE FILTER PAPER CO.
56 East 24th Street - Chicago, Ill.

DIRECT IMPORTERS AND EXPORTERS

CONSIDER IN YOUR PRODUCTION

SHELLAC

ORANGE · BLEACHED · DEWAXED · A and R FREE
OUR PRICES ARE ALWAYS COMPETITIVE

Consult **SCHWAB BROTHERS CORP.**
102 MAIDEN LANE, NEW YORK 5, N. Y.
CHICAGO AGENT: JAS. H. FURMAN CO., 310 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILLINOIS

The Chemical MARKET PLACE

Classified Advertisements

Local Stocks
Chemicals • Equipment

Raw Materials
Specialties • Employment

CONNECTICUT

a-CHLOROMETHYL-NAPHTHALENE
a-NAPHTHALENEACETIC ACID
a-NAPHTHALENEACETAMIDE
METHYL-a-NAPHTHALENEACETATE
AVAILABLE IN QUANTITY
WESTVILLE LABORATORIES, INC.
13 Housatonic Ave.
DEPT. V DERBY, CONN.
PRODUCED BY
WESLAB

ILLINOIS

Now Available
CHEMICALLY PURE
METHYL METHACRYLATE
(Monomeric - Liquid)
$CH_2=C(CH_3)-COOCH_3$

Boiling Point	100.5°C
Specific Gravity	0.950
Refractive Index	1.417
Viscosity at 25° C	0.59
Color	Water-Clear

Samples Upon Request

PETERS CHEMICAL MFG. CO.
3623 Lake Street
MELROSE PARK, ILL.

CHEMICALS
"From an ounce to a carload"
SEND FOR OUR CATALOG
ARTHUR S. LaPINE & COMPANY
LABORATORY SUPPLIES AND REAGENTS
INDUSTRIAL CHEMICALS
121 WEST HUBBARD STREET
• CHICAGO 10, ILLINOIS •

MASSACHUSETTS

ALAN A. CLAFLIN
Manufacturers' Agent
DYESTUFFS and CHEMICALS
Specializing in
BENTONITE
AND
TALC
88 Broad Street Boston 10, Mass.
TELEPHONE Liberty 5944 - 5945

DOE & INGALLS, INC.
Chemicals and Solvents
Full List of Our Products; see Chemical Guide-Book
Everett Station, Boston EVErett 4610

E. & F. KING & Co., Inc.
Est. 1834
52 Purchase Street Boston, Mass.
New England Sales Agent
HURON PORTLAND CEMENT CO.
Industrial Chemicals
(CO_2)
Solid Carbon Dioxide

INDUSTRIAL CHEMICALS
RAW MATERIALS
IRVING M. SOBIN CO., INC.
72-74 Granite Street
Boston, Mass.
Tel. South Boston 3973
IMPORTERS and EXPORTERS

NEW JERSEY

FOR PROMPT SERVICE IN THE NEW YORK AREA
SOLVENTS—ALCOHOLS
EXTENDERS
CHEMICAL CP SOLVENTS
Incorporated
60 PARK PLACE NEWARK 2, N. J.

Semi-Carbazide Hydrochloride
•
Hydrazine Sulphate
Commercial and C. P.
•
Hydrazine Hydrate
85% and 100%
FAIRMOUNT CHEMICAL CO., INC.
Manufacturers of Fine Chemicals
600 Ferry St. Newark 5, N. J.

NEW YORK

HORMONES
ESTROGENS
(In oil or tablet base)
POTENCY ASSURED
QUALITY PROTECTED
PERFORMANCE GUARANTEED
Biologically assayed and standardized at 10,000 International Units of ESTRONE U. S. P.
Per cc
HEMA DRUG CO., inc.
Manufacturers of rare chemicals
66-38 CLINTON AVE. MASPETH, NEW YORK
Tel. NEWTOWN 9-2110

IDEAL REPLACEMENT PRODUCTS
Ammonium Thioglycolate
Agar Agar U.S.P.
Delto Zinc Oxide
Delto Gum Benzoin Synthetics
Menthol U.S.P. & Synthetics
Delto Carbon Blacks
DELTON PRODUCTS CORP.
489 FIFTH AVENUE NEW YORK 17, N. Y.

RHODE ISLAND

J. U. STARKWEATHER CO.
INCORPORATED
241 Allens Ave.
Providence, R. I.
INDUSTRIAL CHEMICALS
TEXTILE SPECIALTIES

GEORGE MANN & CO., INC.
FOX POINT BLVD.
PROVIDENCE 3, R. I.
PHONE — GASPEE 3466
TELETYPE PROV. 75
Branch Office
250 STUART STREET, BOSTON, MASS.
PHONE — HUBBARD 0661
INDUSTRIAL CHEMICALS
RED OIL
STEARIC ACID

PENNSYLVANIA

FOR ALL INDUSTRIAL USES

AFCO BRAND

CHEMICALS

SINCE 1855

Spot Stocks
Technical Service

ALEX C. FERGUSSON CO.
450 Chestnut St. PHILADELPHIA, PA.
and Allentown, Pa.
Lombard 2410-11-12

MACHINERY and EQUIPMENT FOR SALE

New and guaranteed used steel pipe and boiler tubes.

Wood and steel tanks.

Buildings, pumps, valves & fittings.

High pressure boilers from 300 to 633 HP from 160# to 200# pressure.

Write for our list.

JOS. GREENSPON'S SON PIPE CORP.
National Stock Yards,
St. Clair Co., Ill.

MACHINERY FOR SALE

25—Heat Exchangers, Tubular, Various Sizes
2—750 Gal. Glass Lined Tanks
2—Erie Boilers HRT—180 HP, with Stokers
10—150 Gal. Horizontal Aluminum Closed Tanks (New)
1—3 x 4 x 8′ Long Trough Agitator
30—Steel Tanks, 800 to 10,000 Gal. Cap.
1—Horizontal Jacketed Mixer, 7′ Dia. x 10′ Long
1—Copper Steam Jacketed Still Pot, 5500 Gal. Cap.
4—1050 Gal. Oak Closed Tanks
8—Wood Tanks, 11′ x 11′
1—Door 8 x 12 Vacuum Rotary Filter
1—Frederking Cast Iron Still
1—20″ Cast Iron 20 Plate Column
2—Copper Vacuum Stills, Gas Fired
2—Grain Storage Bins, 2500 Bu. Each
Also: Cast Iron Filter Presses—Pumps—Air and Ammonia Compressors—Dough Mixers—New Stainless Steel Tanks and Kettles.

Write For Latest Stock List

PERRY EQUIPMENT & SUPPLY COMPANY
1515 W. Thompson St. Phila. 21, Penna.

VALVES

New and Reconditioned Iron and Steel
ALL TYPES AND SIZES
ALSO FITTINGS
Tested and Guaranteed

APEX IRON & METAL COMPANY
2204 S. Laflin Street
Chicago 8, Illinois

SPECIALS — JUST RECEIVED

Stokes Universal G-1 Auger Type Filler, Practically New.
Elgin 24 spout Rotary Vacuum Filling Machine.
Pfaudler 200-300 gallon jacketed glass lined Tanks with M.D. Agitators.
Gayco Air Separator.

DOUBLE AND SINGLE ARM MIXERS: W. & P., Day Cincinnatus and Imperial Type Mixers; Hottman, Paragon, Read, Single and Double Arm from 2 gallons to 300 gallons.
Schutz O'Neill, Jay Bee, Williams, Gruendler, etc., Pulverizers.
J. H. Day and Kent, Three Roll 12″ x 30″, 16″ x 40″ Mill, motor driven with motor.
Pneumatic Straight Line Labeler.
Mullers or Chasers 2 ft. to 6 ft. sizes.
Ermold and World Semi-Automatic Labeling Machines.
U. S. Bottlers C-10 and A-6 Acme Fillers.
Copper and Aluminum Steam Jacketed Kettles with and without Agitators.
Hobart, Read and Century Vertical Mixers, M.D.
Johnson and Oliver Sweetland Filter Presses.
Copper Stills and Vacuum Pans.
Huhn Rotary Continuous Dryers.
Schutz O'Neill Rotex, and Allis-Chalmers Lowhead Sifters.
Package Machinery Co., Johnson, Miller, all types of Wrapping, Packaging and Cartoning Equipment. (Please Submit Samples of Your Item with Your Inquiry.)

All machines are subject to prior sale.

Write for Latest Circulars.
Wire Collect for Prices and Details!

Union Standard Equipment Company
318 Lafayette Street, New York 12, N. Y.

100—Box & Gondola Cars
100—8000 gal. R. R. Tank Cars
2—2000 to 4000-gal. Emulsion Colloid Mills
6-100-150 & 200 H.P. Diesel Units
343 KW 3/60/2300 F. M. Diesel
480 KW 2300 V Diesel Generator
Raymond No. 0 Automatic Pulverizer
5′ x 33′ Steam Jacketed Vacuum Dryer
8—3 x 4 and 4 x 7 Hummer Screens
3 x 30, 3½ x 24, 5½ x 60, 6 x 40 and 6 x 59 Direct Heat Dryers
18 x 36 & 42 x 10 Acme Jaw Crushers
24″ Blast Furnace with movable curb for Lead, Tin and similar metals
20 H. P. Charlotte 1¼ in. Colloid Mill
1 yd. P. & H. 50′ Boom Cat. Crane

STORAGE TANKS
14—10,000, 15,000, 20,000 and 26,000-gal. Cap. Horizontal and Vertical

AIR COMPRESSORS
Electric—540, 676, 1,000 and 1,578 ft.
Diesel—360, 500, 700 and 1,000 ft.

R. C. STANHOPE, INC.
60 East 42nd St. New York, N. Y.

AVAILABLE

1—60 gal. Copper Vacuum Still.
2—(New) 24 x 48″ Vibrating Screens.
1—40″ Tolhurst copper basket Centrifugal.
2—Mikro Pulverizers: 12″ and 24″.
2—#600 De Laval Clarifiers.
5—3-roll Mills: 16x40 and 12x30″.
1—3-stage 75 hp. Centrifugal Pump.
2—4 x 6′ Atmospheric Drum Dryers.
4—Lead-lined Tanks, 400 and 1000-gal.
2—Triangle Fillers, Gluers, Sealers.
3—Oliver Filters: 5x4′ and 6x4′.
1—Union 10x20x12″ Dry Vacuum Pump.
1—3′ Copper Vacuum Pan.
4—Water Stills: 10 and 25 GPH.
1—Howe 3500# Dormant Platform Scale.
1—10 gal. Bufflovac jac. Autoclave.
What equipment have you for sale?

LOEB EQUIPMENT SUPPLY CO.
920 North Marshfield Ave., Chicago 22, Ill.

1 — Practically new Hardinge Conical Mill for sale.

Box 1885

Chemical Industries, 522 Fifth Ave.,
New York 18, N. Y.

AUTOCLAVES

1—42″ dia. x 24′-4″ Vertical, Forge Welded Steel, 600 lbs. Pressure—1300 gals.
1—4′ x 6′ Vertical, Iron Body, Steel Jacketed, 200 lbs. Pressure—600 gals.
1—4′ x 15′ Vertical Steel, Jacketed, 125 lbs. Pressure—2400 gals.
2—3′ x 18′ Horizontal, Steel, Jacketed, 300 lbs. Pressure—800 gals.
1—10′ x 25′ Vertical or Horizontal, Forge Welded Steel, Jacketed, 100 lbs. Pressure.

AGITATOR DRIVES

1—De Laval Type E Vertical Worm Gear. Ratio 70 to 1. 1200 R.P.M. Imput—10 H.P.
1—D.O. James—Size 1300 Vertical Worm Gear, Ratio 82 to 1, with base plate for 5 H.P. motor drive.
1—General Electric Vertical Gear Reduction Output Speed 5 R.P.M.—7½ H.P. G.E. Motor—Totally Enclosed—220 volts—3 phase—60 cycle.

CONDENSERS

1—Elliott Ehrhart Iron Body Surface Condenser—two pass 245 sq. ft. Surface—½″ brass tubing and Tube sheet.
1—All copper condenser, Coil Type, 60 sq. ft. surface, removable from shell.

CRYSTALLIZERS

5—4′ x 24′ x 2′6″ Deep Stainless Clad Steel, Jacketed—1800 gals.

DRYERS

3—Barlett & Snow Vertical Steel, Jacketed, 10′ dia. x 4′ high, Agitators, Reducers, 2 H.P. Motors.

EXTRACTORS

6—Burkhardt & Viersen, sizes 32″ & 40″ dia., bronze, rubber-covered and Lith-coated baskets.
6—40″ Centrifugal Extractors.
6—10″ " "
1—38″ " "
1—26″ " "
1—20″ " "
Bronze, Rubber and Lithcoated Baskets, Belt and Direct Drives.

FRACTIONATING COLUMNS

1—24″ dia. Cast Iron—40 Sections, each 6″ high with dome and bottom sections—14 bubble caps per section.
1—18″ dia.—Cast Iron—with Dephlegmator—15 sections, each 6″ high—2 top & bottom sections each 18½″ high.

KETTLES

1—8′ dia. x 10′ deep, Iron body with heating coil, agitator & drive, 3000 gals.
2—4′ dia. x 4′6″ deep Iron body, anchor agitator and newport drive, 400 gals.
1—4′ dia. x 4′ deep Iron body, agitator & drive, 400 gals.
1—3′6″ dia. x 5′ deep, steel jacketed, lead lined with agitator, 350 gals.
1—4′6″ dia. x 3′ deep, steel jacketed, with agitator and drive, 350 gals.
1—3′6″ dia. x 5′ deep cast steel, jacketed, no drive or agitator, 350 gals.

PUMPS

1—Wilfley Model AB Centrifugal—7½ H.P. motor—2″ inlet, 1½″ discharge.
1—Shriver Diaphragm 3A—lead liquid ends, 90 gals., motor drive.
1—Shriver Diaphragm 3A—Rubber lined, 90 gals., motor chain drive.
4—Vacuum single phase stokes—size 8″ x 6″, pulley drive.
1—Quimby 4 stage Centrifugal, 500 gals.—75 H.P. G.E. motor.
1—American Well 2 stage Centrifugal, 350 gal. 30 H.P.G.E. motor, Magnetic Starter.
2—Gould Triplex Plunger—size 8″ x 10″—400 gals. Pulley Drive.
1—Gould Triplex Plunger—size 3″ x 4″—25 gals. V Belt Drive.
1—Quimby Screw Type—size 2″—3 G.P.M.—50′ head—motor drive.

ROTARY DRYER OR KILN

1—3′ dia. x 40′ long Horizontal Rotary Dryer, ½″ shell, complete with tires, ring gear, rollers gearing, base plates.

DURIRON PIPE AND FITTINGS
Sizes 1″, 2″, 2½″, flanged.

EMSCO EQUIPMENT COMPANY
Emil A. Schroth, Owner
49 HYATT AVE., NEWARK 5, N. J.
Phone Mitchell 2-3536

LIQUIDATIONS

MACHINERY & EQUIPMENT

of

LARGE CHEMICAL PLANT

located at

ANNISTON, ALABAMA

A FEW ITEMS

1—42" TURBO MIXER with 7½ H.P. motor.

COMPLETE YORK AIR CONDITIONING PLANT, capacity 49 tons refrigeration, to handle 11,000 cu.ft. dehumidified air per minute.

1—24 Truck Tunnel DRYER.

5—ROTARY DRYERS, 2 x 24', 4 x 30', 6 x 40'.

3—Sets Walker Swenson 3-deck CRYSTALLIZERS.

3—Jeffrey 12 x 24 single deck VIBRATING SCREENS.

1—Battery of two 3 x 5 TYLER HUMMER SCREENS, 3-deck.

2—Fansteel Hydrochloric ACID ABSORPTION SYSTEMS.

1—Sturtevant Balanced ROLL CRUSHER, 30" x 16".

1—1,000 Gal. Duriron KETTLE.

Miscellaneous: Tanks—Stainless steel lined, rubber lined, lead lined, and proof brick lined; Bucket Elevators; Agitators; Pumps; Motors; Crushing Equipment; etc.

Arrange to Inspect.

Send for Descriptive Circular.

COMPLETE LIME BURNING AND HYDRATED LIME PLANT

(For sale in whole or in part)

1—8' x 120' Vulcan Rotary Kiln, complete.

1—5' x 50' Vulcan Rotary Cooler.

3—Bucket Elevators steel enclosed—78', 45', 35' c-c. including smaller elevators, screw conveyors, etc.

2—No. 0 Raymond Beater type Pulverizers, each equipped with air classifier, exhauster, cyclone collector, tubular dust collector and inter-connecting piping.

1 Kritzer Lime Hydrator, 6 cylinders, capac. 6 tons per hour.

1—Sturtevant Rock Emery Mill with 40 H. P. Motor.

3-60-440 volt Motors and Starting Equipment will be included with all of the above machines.

All Other Bucket Elevators, Screw Conveyors, etc., included.

WANTED

YOUR IDLE MACHINES

There's still a war to be won.
Help create those jobs!
Send us your list
NOW

Send for latest issue of "Consolidated News"

Consolidated Products Co., Inc.

14-18 Park Row — New York 7, N. Y.

We Buy and Sell from a Single Item to a Complete Plant

BRAND NEW

NEVER USED!

OLIVER HOPPER

DEWATERERS

8'-0" Dia. x 6'-0" Face—100 sq. ft. Area complete with vari-speed drive and supporting frame. Acid-proof construction. Write for Drwgs., Pictures. REAL BARGAIN!

Stainless Steel Pasteurizing Equipment, Incl. Holding Tank, Precision Heater, Preheater and Circulator, like new. Single Drum Dryer, Stainless Steel. Proctor-Schwartz Continuous "Airlay" Dryer . . . Stainless Steel Freeze Roll.

●

USED & REBUILT

48" DIA. C.I. RECTIFYING COLUMNS. Containing 24 Bubble Cap Type Plates. 6 caps per plate. Complete with coolers.

78" DIA. C.I. RECTIFYING COLUMNS. 30 Bubble Cap Type Plates with 12 caps per plate. Complete with coolers, etc.

8'4" to 10'0" STEEL COLUMN containing 19 8'4" dia. and 9—10'0" dia. Bubble Cap Type Plates. Drawings available.

45" DIA. STAINLESS STEEL COL. Containing 26 Bubble Cap Type Plates. Like new.

TANKS, COPPER, STEEL, BRASS, ALUMINUM, STAINLESS—Large Stock.

AMMONIA COOLERS.

HAMMER MILL: Williams, Cap. 1,000 to 1,200 lbs. corn per hour.

2—JEFFREY SWING HAMMER SHREDDERS—Type E—Size 42" x 36". Compl. with Westinghouse 100 H.P. motor, etc.

PUMPS—CENTRIFUGAL & STEAM, all sizes. Bronze or iron.

TUBING & PIPE—Stainless, brass, aluminum, copper.

YEAST CULTURE MACHINE—All copper.

ACE OIL BURNER—excellent condition.

LAWRENCE TRIPLE EFFECT EVAPORATOR. Complete in one body.

9—COIL-TYPE VACUUM PANS. (Complete with Condensers, Catch-alls, etc.)

2—WORTHINGTON CONDENSERS, 1,150 sq. ft. surface, each—complete with simplex pumps. Others from 100 to 1000 sq. ft. of surface.

CLOSE-OUT: VALVES—All Sizes.

SURPLUS EQUIPMENT NEEDED

A single piece or a complete plant.
Send us your list.

Write for our Complete List

ORELAND EQUIPMENT CO.

P. O. BOX "E", ORELAND, PENNA.

FOR SALE!

3—Stainless Steel Tanks 3000, 4700 gal.
6—8' x 6' Oliver Top Feed Acid Proof Filters or Dewaterers. BRAND NEW.
1—Oliver Robison 6' x 4' Filter.
5—Shriver 18" to 42" Filter Presses.
1—Haveg 2000 gal. Tank.
2—Sweetland Filters No. 2 & 5.
3—Shriver and Sperry Rubber, Bronze Filter Presses, 36" x 36", 24" x 24".
1—9' x 70' Allis Chalmers Rotary Kiln.
1—Atmos. Truck Dryer with 35 trucks.
1—Buffalo 24" x 20" vac. Drum Dryer.
2—Buffalo, Devine Vac. Shelf Dryers.
1—W. & P. Jacketed Mixer, 100 gal.
10—Centrifugals, 20" to 48", all types.
3—Sharples No. 6 Presurtite Centrifuges.
2—1200 gal. Steel Jacketed Closed Kettles.
2—1750 gal. Lead Lined Pressure Tanks.
2—Scott 1250 gal. Jacketed Mixers.
3—Pfaudler 200 gal. Jacketed Kettles.

BRILL Equipment Co.

225 WEST 34th STREET, NEW YORK 1, N.Y.

Representative Offerings

1—W. & P. Jack. 20 gal. D.A. Mixer M.D.
2—New Jersey Automatic Pony Labelers.
1—Ross 16 x 40 Three Roll Mill M.D.
1—Kent 12 x 30 Three Roll Mill B.D.
1—Buffalo 6' Jack. Vacuum Crystallizer.
2—Buffalo 3' x 6' open Jack. Crystallizers.
1—Buffalo 5' x 6' Vac. Drum Dryer—Chrome Plated.
1—Semi-Steel Autoclave 60 gal. with agitator, 300# Internal Pressure.
1—Oliver 8' x 8' Continuous Rotary Filter.
2—Filter Presses 24" & 42", Washing Style, C.D.
3—Standard 6' to 10' Carton Sealers.
2—Day 600# Powder Mixers.

We buy your surplus, send us your lists.

MACHINERY & EQUIPMENT CORPORATION (of N. Y.)

533 West Broadway — New York 12, N. Y.
Gramercy 5-6680

FOR SALE

1—New Unitable 12" belt 10' long with motor & variable speed dr.
1—Tolhurst 32" b. dr. copper basket centr.
3—Ermold semi-automatic labelers.
1—Grammes steam mixer 51 gal. cap.
1—Dorrco rubber-lined 4" diaphragm pump.
1—Buffalo Vertical sump pump—4" suction.
5—Pfaudler reaction kettles—150-300 gal. cap.
1—Drake alcohol recovery still—steel 50 gal. cap.
1—Gould cent. pump. 10" x 8" bronze fitted, ball brg.

NEW STAINLESS-STEEL STORAGE & MIXING TANKS—NEW WOOD TANKS ANY SIZE

Girard Machinery & Equipment Co.

949 N. 9th St. — Lom. 6744 — Phila. 23, Pa.

WANTED TO BUY

We Buy and Sell at Any Point New and Used Tight and Slack Barrels; Steel Drums and Cans.

BUCKEYE COOPERAGE CO.

3800 Orange Avenue
Cleveland 15, Ohio

Wanted—Surplus
RAW MATERIALS
Wastes—By-Products—Residues of All Kinds.
BOX No. 2014

Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

WE WANT TO PURCHASE

Rotary Tablet Machines, Copper Cooling Pans, and Dry Powder Mixing Machines. Box No. 2032.

Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

Realize Large Tax Benefits

LONG ESTABLISHED, REPUTABLE CONCERN WITH SUBSTANTIAL CAPITAL

WILL BUY FOR CASH

Assets, Capital Stock, Family Holdings of

INDUSTRIAL PLANTS, MFG. DIVISIONS, UNITS

We are Principals, and act only in strictest confidence, retaining personnel wherever possible. Address

BOX 1210 — 1474 BROADWAY, NEW YORK 18, N. Y.

WANTED

To manufacture on a small scale some chemical requiring high temperature, high pressure, hydrogenation equipment which we have available. Box 2026.

Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

WE WANT TO PURCHASE

Rotary Tablet Machines, Copper Cooling Pans, and Dry Powder Mixing Machines. Box No. 2032.

Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

Established Manufacturer of Potash and liquid soap would like to purchase concern making metallic soaps or synthetic detergents or disinfectants. Box 2034, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

HELP WANTED

SALES MANAGER

Established chemical plant, located Philadelphia, has unusual opportunity for man with successful sales background — to take complete charge of sales.

Must be well acquainted with the textile, paint, leather and detergent fields. The position offers an unusual opportunity for the right man to grow with an aggressive company.

Please give full details in first letter. Everything, of course, will be held in strict confidence. Salary open.

BOX 2033
CHEMICAL INDUSTRIES
522 Fifth Ave., New York 18, N. Y.

SALES REPRESENTATIVE WANTED

A leading Eastern manufacturer of Industrial Finishes — Lacquers, Synthetics, Varnishes, etc. — offers an excellent opportunity to a young, progressive man who has had sales experience but not necessarily in this field.

He will be assigned to Chicago and surrounding territory.

In addition to a successful selling experience, the man who makes the connection must have a pleasing personality, good appearance, and ability.

Send an outline of your experience, a photograph and salary expectations to Box 2030, Chemical Industries, 522 Fifth Avenue, New York, New York.

All replies will be held confidential.

CHEMISTS—CHEMICAL OR MECHANICAL ENGINEERS

ARE YOU PRODUCING SUCCESSFULLY BUT NOT ADVANCING FAST ENOUGH?

If so we have openings in our organization, an industrial chemical process industry.

Our company is an expanding chemical plant based on the Viscose process, with excellent post war possibilities.

The men needed should have production control and/or Design experience.

Location—Mid West
Age Preferred—30 to 40
Salary—Depending on Qualifications.

Our organization is acquainted with this advertisement.

Write giving complete personal and technical history to Box 2015.

Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

Expanding Research Department of Manufacturer of packaging materials requires technical personnel. Positions open from section leaders to laboratory technicians. Work covers research as well as control and testing of many products, particularly synthetic resins. Location—attractive small community in Ohio. Please state qualifications, age, salary requirements and availability. Box 2024.

Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

CHEMIST WANTED

A leading Eastern manufacturer of Industrial Finishes — Lacquers, Synthetics, Varnishes, etc. — offers an excellent opportunity to a chemist who is looking for a position in the finish manufacturing industry. Experience in the field is desirable but not essential. The position is in the vicinity of Newark, New Jersey.

Send an outline of your experience, a photograph and salary expectations to Box 2036, Chemical Industries, 522 Fifth Avenue, New York 18, N. Y.

All replies will be held confidential.

PURCHASING AGENT WANTED

A leading Eastern manufacturer of Industrial Finishes — Lacquers, Synthetics, Varnishes, etc.—offers an excellent opportunity to a progressive man who has had purchasing experience, particularly in the chemical industry.

His position will be in the vicinity of Newark, New Jersey.

Send an outline of your experience, a photograph, and salary expectations to Box 2031, Chemical Industries, 522 Fifth Avenue, New York, New York.

All replies will be held confidential.

CHEMICAL ENGINEERS!

Specialists in various fields to work on fee basis. Important research organization requires outside assistance. State qualifications, specialty, background and references. Box 2038, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

SITUATIONS WANTED

BRASS TACKS DEPARTMENT

No bush-beater-about, well-known chemical merchant with connections is busy but could be busier. Facilities and time for several additional lines. Prefer chemical specialties and pharmaceuticals. Can handle New York, New England and exports.

BOX 2035
Chemical Industries, 522 Fifth Ave.
New York 18, N. Y.

SALES DEVELOPMENT— Organic Chemist

M.A. 25, draft exempt. Experience with corrosion paints and varnishes, diversified. Creative ability, personality.
Box 2040, Chemical Industries, 522 5th Ave., New York 18, N. Y.

Graduate chemist, in middle fifties with considerable industrial experience in purchasing, consultation, research problems in manufacturing processes and materials, laboratory management seeks new full-time or part-time job of this kind or in sales work. Reliable, energetic, tactful. Available soon. Box 2039, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

BUSINESS OPPORTUNITIES

FRENCH IMPORTERS
with excellent connections among industrial consumers and specializing in introducing of new technical and pharmaceutical chemicals offer their services to responsible American manufacturers desiring to expand their business in Europe. Best references U.S.A. Apply Box 2037, Chemical Industries, 522 Fifth Ave., New York 18, N. Y.

PATENTS

PROFESSIONAL DIRECTORY

MOLNAR LABORATORIES
Analytical and Consulting Chemists
Phenol Coefficient Tests
Hormone Assays
PENICILLIN ASSAYS
Investigation, Control and Development of Pharmaceutical Products
211 East 19th St., N. Y. Gramercy 5-1698

RALPH L. EVANS ASSOCIATES
70 Chemists and Engineers
Fully Equipped
Laboratory and Pilot Plant
Organic and Inorganic Chemicals
Condensation Products
Continuous Processes
High Pressure
Raw Material Substitution
250 E. 43rd Street, New York 17, N. Y.
Tex. MUrray Hill 3-0072

HORACE J. HALLOWELL
Analytical
and Consulting Chemist
323 Main St.
Danbury, Conn.
Member Association of Consulting Chemists & Chemical Engineers

ASSOCIATION OF CONSULTING CHEMISTS AND CHEMICAL ENGINEERS, INC.
50 East 41st Street
Room 82
New York 17, N. Y.
LExington 2-1130
A Clearing House for Consultants
When in need of a consultant address the Association
No charge for this service.
The membership, located from coast to coast, comprises specialists in all fields.

FOSTER D. SNELL, INC.
Our chemical, bacteriological, engineering and medical staff with completely equipped laboratories are prepared to render you Every Form of Chemical Service.
Ask for
"The Consulting Chemist and Your Business"
315 Washington Street Brooklyn 1, N. Y.

DR. HENRY W. LOHSE
Research, Development and Surveys
Bulletin No. 10, Unit Processes
Synthesis Catalysis.
Copy free on request
67 Yonge St., Toronto, Ontario
Telephone: Elgin 4797
U. S. Associates Located at
Chicago and Philadelphia

Rubber Survey

(*Continued from page 264*)

Texas, with a designed capacity of 20,000 tons per year. In July, 1942, Standard Oil Development Co. informed Rubber Reserve Co. that recent improvements in the Butyl rubber process had made it possible to increase the combined capacity of the two projects to a total of 192,000 tons per year at an estimated additional investment of only twenty-seven per cent. Standard Oil Development Co. was requested to work out the best possible balance of the situation to provide a maximum of additional capacity without increasing the use of steel and other construction materials. As a result of this study, Standard Oil Development Co. estimated that the capacity of the two Butyl rubber projects could be increased to a total of 132,000 tons per year without any net increase in the amount of construction materials, such increase including an expansion of the facilities for the preparation of isobutylene. The rated plant capacity was increased to 132,000 tons per year on this basis. However, the development was not found to be practicable in commercial operation, and consequently the plants were constructed as originally designed (such design having since been modified) and the rated plant capacity was decreased to 68,000 tons per year.

The first unit in the Baton Rouge plant was completed early in 1943. Serious difficulties were encountered which indicated the need for extensive plant alterations and as a result of conferences held with representatives of Rubber Reserve Co. and the Office of the Rubber Director, Standard Oil Co. of La. proposed to undertake at its own expense an experimental and development program, such program to include the making of whatever plant changes were deemed by it to be necessary to improve the process. and that the unit would be turned over to the government at the end of such experimental program at no additional cost to the government, except for such final changes as the government might see fit to approve and accept.

Major operating difficulties have been experienced by producers of GR-I, and it was not until the latter part of 1944 that the plants operated at sufficiently high rates to indicate the magnitude of operating costs which may be expected at rated capacity. The cost of manufacturing GR-I was approximately 13-18¢/lb. during the last quarter of 1944, when operating rates reached 50-80% of rated capacity. Higher production rates and lower costs are expected this year.

Private Synthetic Rubber, Butadiene, and Styrene Plants

Company	*Location*	*Approximate Annual Capacity Short Tons*
A. Butadiene		
Publicker Com. Alcohol Co.	Philadelphia, Pa.	10,000[1]
Standard Oil Co. of New Jersey	Baton Rouge, La. (2 plants)	12,000
Carbide & Carbon Chem. Corp.	Charleston, W. Va.	5,000
Dow Chemical Co.	Midland, Mich.	2,700
Phillips Petroleum Co.	Borger, Texas	2,000
Shell Union Oil Corp.	Houston, Texas	8,000
Ugite Sales Corp.	Chester, Pa.	800
Celanese Corp.	Bishop, Texas	10,000[2]
Total		50,500
B. Styrene		
Dow Chemical Co.	Midland, Mich.	18,000
		Long Tons
C. GR-S (Butadiene-Styrene Type)		
Dewey and Almy Chemical Co.	Cambridge, Mass.	1,800
D. GR-M (Neoprene Type)		
E. I. du Pont	Deepwater, N. J.	9,750
E. GR-A (Butadiene-Acrylonitrile Type)		
Firestone Tire & Rubber Co.	Akron, Ohio	1,800
Goodyear Tire & Rubber Co.	Akron, Ohio	4,800
Hycar Chemical Co.	Akron, Ohio	9,400
Standard Oil Co. of New Jersey	Baton Rouge, La.	5,000
Total		21,000

Data from various government sources.
[1] Presently shut down.
[2] Not yet completed.

waxes

Quality D.T. Brand

SPECIAL LIGHT American Double Refined

CANDELILLA

DOMESTIC

OZOKERITES

WHITE AND YELLOW

CERESIN WAXES

VARIOUS MELTING POINTS

AMORPHOUS WAXES

Write for Bulletin C

DISTRIBUTING & TRADING CO.

444 MADISON AVENUE • NEW YORK 22

HUISKING

1910 1945

CHEMICALS

PHARMACEUTICAL INDUSTRIAL

DRUGS, OILS, RAW MATERIALS

IMPORT & EXPORT

Merchants

Direct Importers. Selling Agents for Producers of raw materials in foreign countries. • Distributors for Principal American Manufacturers in the domestic and foreign markets. • Buying Agents for Leading Houses in all parts of the world.

MENTHOL CRYSTALS U.S.P.
for prompt and future shipment

CAMPHOR U.S.P. Du Pont
Powder — Tablets

ARECOLINE HYDROBROMIDE, N.F.

SULFA DRUGS

HYOSCINE (Scopolamine) HYDROBROMIDE U.S.P.
now available for prompt delivery

LYCOPODIUM U.S.P.

BEESWAX U.S.P.
Yellow and Bleached

SULFUR PRECIP., U.S.P.
Sylvania Brand

OIL CAMPHOR WHITE SYNTHETIC

PAPAIN

SPERMACETI U.S.P.

HAARLEM OIL

QUINCE SEED

PREPARED CALAMINE, N.F.

LANOLIN U.S.P.
Hydrous and Anhydrous

CHAS. L. HUISKING & CO., INC.

155 VARICK STREET, NEW YORK 13, N. Y.

Chicago Office
561 E. Illinois St.

Cable Address
HUISKING, NEW YORK

LONDON AGENTS: Wheeler & Huisking, Ltd., 26 Great Tower St., London, E.C. 3, England

INDEX *of* ADVERTISERS

Allied Asphalt & Mineral Corp. 345
Amecco Chemicals, Inc. 286
American British Chemicals Supplies, Inc. 321
American Cyanamid & Chemical Corp. ..... 198 and 199
American Potash & Chemical Corp. 302
American Resinous Products Co. 349
Ansul Chemical Co. 288
Ansul Chemical Co., Dugas Division 298
Apex Iron & Metal Co. 1054
Armour & Co. 242
Arnold-Hoffman & Co., Inc. 194
Aromatics Division, General Drug Co. 188
Association of Consulting Chemists & Chemical Engineers, Inc. 357
Atlas Powder Co. 311

Bagpak, Inc. 305
Baker, J. T., Chemical Co. 193
Baker & Adamson, Division of General Chemical Co. 233
Baker Castor Oil Co. 207
Barrett Division, Allied Chemical & Dye Corp. 195
Beacon Co. 359
Becco Sales Co. 352
Bemis Brothers Bag Co. 316
Blaw-Knox Co. 293
Bower, Henry, Chemical Mfg. Co. 350
Brill Equipment Co. 355
Buckeye Cooperage Co. 355
Burkart-Schier Chemical Co. 359
Burke, Edward S. 340

Carbide & Carbon Chemicals Corp. 201
Celanese Corp. of America ..... 204 and 205
Chemical Construction Corp. 208
Chemische Fabrik Schweizerhall, A. G. 348
Church & Dwight Co., Inc. 327
Claflin, Alan A. 353
Columbia Chemical Division, Pittsburgh Plate Glass Co. ..... 211 and 287
Columbia Organic Chemicals 337
Commercial Solvents Corp. 248
Consolidated Chemical Industries, Inc. 196
Consolidated Packaging Machinery Corp. 329
Consolidated Products Co., Inc. 355
Continental Can Co. 206
Corning Glass Works 221
Cowles Detergent Co. 332
C. P. Chemical Solvents, Inc. 353
Crosby Naval Stores, Inc. 335
Croton Chemical Corp. 359
Crown Can Co. 303

Dallal, D. S. 352
Delton Products Corp. 353
Diamond Alkali Co. 307
Distributing & Trading Co. 358
Doe & Ingalls, Inc. 353
Dorr Co. 200
Dow Chemical Co. ..... 190 and 304
Drew, E. F. & Co., Inc. 332
Dugas Division Ansul Chem. Co. 298
Dunkel, Paul A., & Co., Inc. 329
Du Pont de Nemours, E. I., & Co. 219

Eastern Steel Barrel Corp. 339
Eastman Kodak Co. 337
Edwal Laboratories, Inc. 337
Eimer & Amend 232
Emsco Equipment Co. 354
Enterprise Engine & Foundry Co. 203
Evans, Ralph L., Associates 1057

Fairmount Chemical Co. 353
Fergusson, Alex C., Co. 353
Filter Paper Co. 352
Fine Organics, Inc. 331
Fisher Scientific Co. 232
Franks Chemical Products Co. 350
Freeport Sulphur Co. 345
Fritzsche Brothers, Inc. 314
Fulton Bag & Cotton Mills 315

General American Transportation Corp. 230
General Chemical Co. ..... Inside Back Cover
General Drug Co., Aromatics Division 323
Girard Machinery & Equipment Co. 355
Glascote Products, Inc. 295
Glycerine Producers' Association 197
Gray, William S., & Co. 345
Greeff, R. W., & Co. 329
Greenspon's, Joseph Son Pipe Corp. 354
Griscom-Russell Co. 223

Haering, D. W., & Co., Inc. 188
Hardesty Chemical Co. 187
Hardesty, W. C., Co. 216
Harshaw Chemical Co. 212
Heekin Can Co. 214
Hema Drug Co. 353
Hercules Powder Co. ..... 228 and 229
Heydeen Chemical Co. 283
Hooker Electrochemical Co. 289
Huisking, Chas. L., & Co. 358
Hunt Chemical Works, Inc. 331

Industrial Chemical Sales Division West Virginia Pulp & Paper Co. 247
Industrial Supply Co. (Pty.), Ltd. 340
Innis, Speiden & Co. 304

Jefferson Lake Sulphur Co., Inc. 335
Joliet Chemicals Ltd. 218

INDEX *of* ADVERTISERS

Kelco Co. 285
Kessler Chemical Co. 330
Kidde, Walter, & Co., Inc. 225
King, E. & F., & Co., Inc. **353**
Knight, Maurice A. 296

LaPine, Arthur S., & Co. 353
Leeds & Northrup Co. 324
Lemke, B. L., Co. 333
Loeb Equipment Supply Co. 354
Lohse, Henry W. 357
Lucidol Corp. 352

Machinery & Equipment Corp. **355**
Mallinckrodt Chemical Works 215
Mann, George, & Co., Inc. 353
Marblehead Lime Co. **243**
Marine Magnesium Products Corp. 337
Mathieson Alkali Works, Inc. 186
Merck & Co., Inc. 220
Metalsalts Co. 333
Mine & Smelter Supply Co. 335
Moesch, Walter & Co. 345
Molnar Laboratories **357**
Monsanto Chemical Co. 277
Mutual Chemical Co. of America 189

National Carbon Co. 217
Natural Products Refining Co. 244
Naylee Chemical Co. 213
Neville Co. 333
Niacet Chemicals Div. U. S. Canadian Corp. **350**
Niagara Alkali Co. ..... Insert between pages 192 and 193

Oil States Petroleum 335
Oldbury Electro Chemical Co. 339
Oreland Equipment Co. 1054
Oronite Chemical Co. 297
Otis McAllister Co. 340

Pacific Coast Borax Co. 334
Patterson-Kelley Co. 291
Pennsylvania Coal Products Co. 340
Pennsylvania Salt Manufacturing Co. 239
Perry Equipment & Supply Co. **354**
Peters Chemical Manufacturing Co. 353
Petroleum Specialties, Inc. 333
Pfizer, Charles, & Co., Inc. 222
Phelps Dodge Refining Corp. 327
Pittsburgh Plate Glass Co., Columbia Chemical Division ..... 211 and 287
Polachek, Z. H. **357**
Porocel Corp. 224
Powell, William, Co. 313
Prior Chemical Corp. 237
Proctor & Schwartz, Inc. 210

Quaker Oats Co. 309

Radio Receptor Co., Inc. 327
Raymond Bag Co. 371
Reichhold Chemicals, Inc. 227
Reilly Tar & Chemical Corp. 240
Robins Chemical Co. 226
Rosenthal, H. H., Co. 333

St. Regis Paper Co. 301
Saranac Machine Co. 339
Schwab Brothers Corp. 352
Sharples Chemicals, Inc. ..... Insert between pages 216 and 217
Shell Chemical, Division of Shell Union Oil Corp. 209
Sherwood Refining Co., Inc. 315
Signode Steel Strapping Co. 241
Snell, Foster D., Inc. 357
Sobin, Irving M., Co., Inc. **353**
Solvay Sales Corp. ..... Inside Front Cover
Standard Alcohol Co. 340
Stanhope, R. C., Inc. 340
Starkweather, J. U., Co. **354**
Stauffer Chemical Co. 231
Sundheimer, Henry, Inc. **294**

Tacoma Chamber of Commerce 235
Texas Gulf Sulphur Co., Inc. 345
Titanium Alloy Manufacturing Co. 281
Turner, Joseph, & Co. 339

Union Bay State Chemical Co. 234
Union Carbide & Carbon Chemicals Corp. 201, 217
Union Standard Equipment Co. 354
U. S. Industrial Chemicals, Inc. ..... 331 and Insert between pages 308 and 309
U. S. Potash Co. 315

Van Range Co., John 351
Velsicol Corp. 202
Victor Chemical Works 279
Vitamoil Laboratory, Inc. 356

Welch, Holme & Clark Co., Inc. 280
Wellington Sears Co. 236
Wellman Engineering Co. 188
Westvaco Chlorine Products Corp. 185
Westville Laboratories 353
Wilson Chemical Feeders, Inc. 299
Witco Chemical Co. ..... Back Cover
Wood Treating Chemicals Co. **325**
Wyandotte Chemicals Corp. 238

PROPYLENE LAURATE
(Edible)

A light amber non-hygroscopic, high-boiling, self-emulsifying oil—soluble in alcohols, oils, etc.—self-emulsifiable in water—miscible with alcohol, glycerine, glycol, hydrocarbons, etc.—pH of 5% aqueous dispersion 8.0—low surface tension and viscosity—non-toxic, edible and practically odorless.

Manufacturers of cosmetics, pharmaceuticals, foodstuffs, paper, textiles, dry cleansing preparations, lacquer emulsions, emulsions for wood, leather and metals, etc., will find Propylene Laurate's emulsifying action, coupling and plasticizing action, and detergent and foam-reducing capabilities of extreme interest.

A DIRECT SOURCE FOR ZINC AND OTHER METALLIC STEARATES

THE **BEACON** COMPANY
PURITY · UNIFORMITY · DEPENDABILITY
Chemical Manufacturers
97 BICKFORD STREET · BOSTON, MASSACHUSETTS

In Canada: PRESCOTT & CO., REG'D., 774 ST. PAUL ST., W. MONTREAL

PENETRANTS • DETERGENTS
REPELLENTS • SOFTENERS
FINISHES

BURKART-SCHIER CHEMICAL CO.
CHATTANOOGA, TENNESSEE

CROTON *Potassium Nitrate*

Sodium Nitrate	Sodium Perborate
Sodium Nitrite	Curosalt (for curing meat)
Borax	Welding Fluxes
Boric Acid	Flameproofing Compounds
Potassium Chloride	Special Products Used in
Caustic Soda	Refining and Casting of
Soda Ash	Magnesium and Aluminum

Manufacturers and Distributors of Industrial Chemicals Since 1836

CROTON CHEMICAL CORPORATION
114 Liberty Street, New York 6, N. Y.

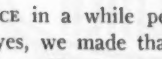
"WE" — EDITORIALLY SPEAKING

THAT CHEMISTS are drearisome wielders of the modifying adverb is a lamentable fact mentioned in the *Detroit Chemist:* ". . . . chemists create about them an air of unsureness, one that will not commit itself too far nor too forcibly. . . . If you talk to him and he doesn't sprinkle his conversation with words like 'maybe,' 'probably,' 'it seems,' 'possibly,' 'this doesn't prove it,' etc., he is not a chemist."

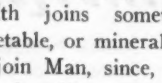
Is there a positive statement in the house?

IT MAY NOT be pleasant to be harpooned with penicillin nor suffer the nausea that often accompanies sulfa drugs, but just take a look in the medicine chest of several centuries ago: You will find there, we have been told, such appetizing items as swine's teeth, putrid meat, and lizard's blood. Perhaps modern doctors aren't so bad after all, even if they do stick you.

PLASTIC dental fillings are admirable, the *New Yorker* says, except that chewing gum sticks to them. "O brave new jaw, with Spearmint cleaving to the choppers as rockweed cleaves to the rock," comments the estimable magazine.



EVERY ONCE in a while people like to fantastify (yes, we made that up) about science. Maxwell's demon, we suppose, was the product of a vivid imagination as was Kekulé's dream of the benzene molecule. Now Norman Corwin writes about "The Undecided Molecule," which tells of the commotion caused in the world of nature when little Molecule X cannot make up his mind which mass of matter to join. He is put on trial for his delinquency and shown that the entire natural economy of the world will be upset unless he forthwith joins something—either animal, vegetable, or mineral. He finally decides to join Man, since, with all his faults, Man is still a pretty wonderful being!



A CLEVER method was used in the much-publicized "Operation Pluto" to find leaks in the pipe lines caused by dragging anchors and the like. Fluorescein was pumped through the leaking pipe line, and when it rose to the surface of the ocean above the leak, the fluorescent patch of sea water was easily spotted from the air.

THE *New York Times* waxed lyrical about scientists on its editorial page after the recent total eclipse:

"The several hundred astronomers and physicists who set up camps in the path of totality demonstrated again that in science men can forget race and nationality and sink their prejudices in a common cause. Science is clearly a unifying force which we have not learned to apply. . ."

Would that the 2,000,000,000 or more people on this earth were scientists!

HOW WOULD *you* retrieve a test torpedo that sinks to the bottom of the ocean? Our navy uses a test head containing a float which is held in the head by a plastic disc made from polyvinyl alcohol. This material is soluble in water, and the formulation is such that the disc disintegrates after a predetermined length of time, releasing the float which marks the location of the drowned torpedo.

THE PAPER INDUSTRY has the distinction of being honored in verse by a queen, no less: Queen Elizabeth of Romania. She wrote in her "Songs of Toil," under the nom de plume Carmen Sylva, that rags should be used

"For pulp, for pulp, to record life's wrong,
For pulp, for pulp, for a poet's song.
It comes out smooth, and glossy, and thin,
From rollers, and wheels, and cylinder's din. . . ."

It is doubtful if she knew the technology of paper-making, but it would appear that she had at least heard a mill in operation.

A PSYCHOLOGIST, Dr. E. L. Thorndike, effectively declares that science cannot improve the lot of mankind unless human nature is changed:

"The welfare of mankind now depends upon the sciences of man. The sciences of things will, unless civilization collapses, progress, extend man's control over nature, and guide technology, agriculture, medicine, and other arts effectively. They will protect man against dangers and disasters except such as he himself causes. He is now his own worst enemy."

Fifteen Years Ago

From Our Files of August, 1930

George P. Huisking, secretary, Charles L. Huisking & Co., resigns to join Matawan Coal Tar Products Co., Matawan, N. J., as vice-president and sales manager, fulfilling ambition of many years to become identified with coal tar manufacturing plant.

Calco Chemical and Heller & Merz combine Boston offices, leasing entire building at 35 Hartford St., each continuing as a separate concern.

Industrial Rayon Corp. holds mid-year sales conference at Cleveland, addressed by H. S. Rivitz, president; A. A. Murphy, sales manager; Hayden B. Kline, technical director; and George Brooks, service manager.

American Solvents & Chemical Co. plans expansion of recently acquired Rossville Distillery and Greendale Co. by about one-third. Carthage plant becomes permanent producer, ethyl alcohol and butyl, Lawrenceburg plant is to produce ethyl alcohol and by-products, and Agnew plant, California, to produce ethyl alcohol, carbon dioxide and by-products.

Monsanto Chemical Co. announces completion of new plant for production of sodium benzoate and benzoic acid by entirely new method.

Shell Chemical Co. new nitrogen fixation plant in Contra Costa County, Cal., will have daily capacity of 60 metric tons fixed nitrogen. Hydrogen will be obtained from natural gas.

Solvay Process Co. starts work on $5,000,000 plant expansion program at Syracuse, August 1.

Hoffman-La Roche, Inc., Nutley, N. J., plans addition to plant to cost over $100,000.

Mathieson Alkali Works, Inc., Niagara Falls, plans early construction of one-story laboratory unit to cost about $70,000.

Bakelite Corp. asks bids on construction of new plant at Bound Brook, N. J., to cost about $1,070,000.

National Oil Products Co., Harrison, N. J., manufacturing oil products based on cod-liver oil, plans four-story expansion costing about $200,000.

Sharp & Dohme, Inc., Philadelphia, manufacturer of chemical specialties, drugs, etc., plans five-story factory addition to plant, to cost over $200,000, including equipment.

Hercules Powder Co. will erect nine one-story buildings to replace several units at Carthage, Mo., at cost of more than $160,000.

PART 2: PATENTS AND TRADEMARKS

Abstracts of U. S. Chemical Patents

A Complete Checklist Covering Chemical Products and Processes

Printed copies of patents are available from the Patent Office at 10 cents each. Address the Commissioner of Patents, Washington, D. C., for copies and for general information concerning patents or trade-marks.

From Official Gazette—Vol. 574, Nos. 3, 4, 5—Vol. 575, No. 1 (May 15-June 5)—p. 591

*Agricultural Chemicals

Producing lumber from poinsettia plants in which the latex is enclosed within plant cells. No. 2,373,690. Paul Kenda.

Stabilizing soil for use as construction material with improved resistance to water erosion, which comprises admixing with soil a water-insoluble ligneous material which comprises free lignin. No. 2,375,019. Abraham Miller to Hercules Powder Co.

*Cellulose

Comminuting natural cellulosic materials, comprising moving cellulosic substance embodying cell-contained liquid through pressure zone and gradually increasing pressure on blanket of substance, etc. No. 2,374,046. Matthew Stacom to Stacom Process Corp.

Production of thick sheets of a thermoplastic cellulosic compound, which comprises preforming a sheet by depositing solution of thermoplastic cellulosic compound in volatile solvent on smooth surface of a rigid support, and evaporating solvent, stripping preformed sheet from support. No. 2,374,308. James Rooney, Ronald Locke, and Philip Hawtin to British Celanese Ltd.

Manufacture of lower fatty acid esters of cellulose, step of precipitating esters from acylation dope comprising adding 10% aqueous solution of a lower fatty acid salt of a colorless cation. No. 2,374,547. Bayard Lamborn to Hercules Powder Co.

Cementing regenerated cellulose to rubber which comprises impregnating regenerated cellulose with cation-active compound and applying rubber latex containing negatively charged rubber particles thereto. No. 2,375,261. Joseph Taylor and Karl Schaefer to North American Rayon Corp.

*Ceramics

Composition for forming refractory structures comprising finely divided zirconium silicate, water dispersible colloid and monohydroxyl base. No. 2,373,864. Eugene Wainer to The Titanium Alloy Manufacturing Co.

Production of magnesia and calcium carbonate from dolomite. No. 2,373,911. Robert Pike to Harbison-Walker Refractories Co.

Production of magnesia from dolomite. No. 2,373,912. Robert Pike to Harbison-Walker Refractories Co.

Cyclic process of producing magnesia and calcium carbonate from calcined dolomite. No. 2,373,913. Robert Pike to Harbison-Walker Refractories Co.

Producing laminated safety glass including two sheets of glass and interposed layer of thermoplastic adherent thereto. No. 2,374,040. Joseph Ryan to Libbey-Owens-Ford Glass Co.

Fabricating laminated glass structure including two sheets of glass and interposed layer of thermoplastic adherent thereto and in which plastic interlayer extends beyond edges of glass sheets. No. 2,374,056. George Watkins to Libbey-Owens-Ford Glass Co.

Laminated structure comprising two sheets of glass and interposed layer of thermoplastic adherent thereto which extends beyond edges of glass sheets to provide an attaching flange, and a metal reinforcement carried by extended plastic. No. 2,374,057. George Watkins to Libbey-Owens-Ford Glass Co.

Treating natural clay to improve surface characteristics thereof which comprises preparing mass of clay and water and comprising alkaline dispersing agent, extruding mass under a high fluid friction, and then removing replaceable metals from extruded product. No. 2,375,641. Allen Garrison to Texaco Development Corp.

*Chemical Specialties

Aqueous medium thickening and congealing agent comprising a dry, powdered mixture of pectin, pectase and a water-soluble salt of a polyvalent metal. No. 2,373,729. John Willaman to the Secretary of Agriculture of the United States of America.

Non-alkaline detergent composition of improved lathering properties comprising water-soluble, normally solid, mild acidifying agent, N-alkyl sulfosuccinamate and water-soluble cellulose ether. No. 2,373,863. Emil Vitalis to American Cyanamid Co.

Cosmetic preparation comprising finely divided particles of body powder encased in a film formed of bentonite and methyl-cellulose. No. 2,373,933. Carl Weeks to The Armand Co.

Treating tall oil to separate a fatty fraction therefrom which comprises dissolving tall oil in ethanol. No. 2,373,978. Ernest Segessemann to National Oil Products Co.

Treating tall oil which comprises esterifying same so as to produce lower alcohol esters of fatty acids in said tall oil; lowering temperature of esterified tall oil in presence of acetone to effect a separation thereof, etc. No. 2,373,979. Ernest Segessemann to National Oil Products Co.

Rigid gel comprising synthetic linear polyamide and an organic solvent therefor. No. 2,374,126. Franklin Peters to E. I. du Pont de Nemours & Co.

Detergent composition in cake form for toilet purposes and possessing cleansing and sudsing properties similarly to ordinary soap, comprising solid, neutral, water-soluble salt of an alkyl sulfoacetate in mixture with solid, water soluble amido body selected from urea, monobutyl urea, dibutyl urea, phenyl urea, etc. No. 2,374,187. Lawrence Flett to Allied Chemical & Dye Corp.

Filament of unlimited length derived from gelatin having a fibre orientation typical of that produced by stretching a jetted filament of gelatin solution. No. 2,374,201. John Highberger and Harold Kersten to Foundation of The Research Laboratory of The Tanners' Council of the United States of America at the University of Cincinnati, Inc.

Cleansing composition in solid cake comprising equal parts of hydrochloride of the lauric acid ester of monoethanolamine and monolaurin. No. 2,374,213. Morris Katzman to The Emulsol Corp.

Heating an unconjugated drying oil with ethylene-alpha-beta-dicarboxylic acid in presence of organic peroxide as catalyst. No. 2,374,381. Frank Root to Ellis Foster Co.

Insecticide composition containing as characterizing ingredient, material derived from petroleum fraction by a multiple pass cracking in presence of adsorptive contact mass material. No. 2,374,387. Vladimir Shipp and Arthur Pabst and Robert Killingsworth to Socony-Vacuum Oil Co. Inc.

Self-polishing composition base in solid condition, for production of a wax-in-water emulsion on mixing with hot water, comprising a dispersion of aqueous soap phase in a wax composition. No. 2,374,414. Leonard Cartwright to Foster D. Snell, Inc.

Stable nonviscous metallic soap solutions. No. 2,374,447. Ralph Madison to Truscon Laboratories, Inc.

Polishing composition possessing improved spreading properties, comprising wax emulsion having 2-methyl-2, 4-pentanediol which functions to improve spreading properties of composition. No. 2,374,474. Frank Dolian to Commercial Solvents Corp.

Insecticide. No. 2,374,479. Samuel Gertler and Herbert Haller to Secretary of Agriculture of the United States of America.

Pitch constituting pitchy residue derived by destructive distillation of a pine wood resin containing 35% of gasoline-insoluble resinous material. No. 2,374,491. Donald Lister to Hercules Powder Co.

Detergent composition in solid mass adapted for toilet purposes and possessing cleansing and sudsing properties similar to ordinary soap, comprising solid nonaromatic soapless detergent which is a neutral, alkali metal salt of an anion-active polar-nonpolar organic derivative of sulfuric acid selected from sulfates and sulfonates of higher aliphatic hydrocarbons in intimate mixture with thiourea, said thiourea serving

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

Patents Available for License or Sale

The Patent Office is regularly publishing a Register of Patents Available for Licensing or Sale. Patents concerning chemical products and processes appear below.

July 17, 1945

Pat. 2,159,214. **Double Salt of Calcium Ascorbate and Calcium Acetylsalicylate and Process of Making Same.** Patented May 23, 1939. The process of preparing a pharmaceutical, commonly known as aspirin, by combining salts or derivatives of acetylsalicylic acid with one or more vitamins, or their salts or derivatives. (Owner) Samuel Klein, 357 Hawthorne Ave., Newark, N. J. Group 28—31. Reg. No. 43.

July 24, 1945

Pat. 2,313,457. **Process and Apparatus for Metallurgical Reduction.** Patented Mar. 9, 1943. Particularly suitable for the treatment of the ores, tin, lead, zinc, cadmium, mercury, copper, magnesium, and aluminum. (Owner) Chester Tietig, 435 Reading Road, Cincinnati 2, Ohio. Group 35—59. Reg. No. 62.

Pat. 1,974,089. **Process of Decolorizing Mineral Oil.** Patented Sept. 18, 1934. Consists of adding fine raw activatable clay to a body of oil, injects a stream of acid anhydride gas which exerts an agitating effect on the oil and clay. Eliminates heavy agitating gear. (Owner) Chester Tietig, 435 Reading Road, Cincinnati 2, Ohio. Groups 29—11; 35—59. Reg. No. 63.

Pat. 1,957,303. **Apparatus for Decolorizing and Filtering Liquids.** Patented May 1, 1934. Maintains the liquid at a given temperature; eliminates keeping filter presses at constant high heat in substantially the same operation. Filtering surfaces are constantly kept clean. (Owner) Chester Tietig, 435 Reading Rd., Cincinnati 2, Ohio. Groups 29—11; 35—59. Reg. No. 66.

Re. Pat. 20,957. **Lubricating Composition.** Patented Dec. 27, 1938. For internal combustion engines, comprising less than 5% and at least 0.10% of a heavy metal salt dissolved in oil. Leaves a residue of metal oxide in combustion chamber which works into pores of metal. (Owner) Chester Tietig, 435 Reading Rd., Cincinnati 2, Ohio. Groups 28—96; 29—11. Reg. No. 67.

to protect soapless detergent from dissolving action of water. No. 2,374,544. Lester Hoyt to Allied Chemical & Dye Corp.

Rendering innocuous available lime content of hydraulic cements by converting readily soluble lime components of hydraulic cement into insoluble metallic compounds by introducing water-soluble reagent from chromic anhydride, manganese trioxide, molybdic acid and neutral water-soluble salts of molybdenum, tungsten, manganese and vanadium into gauging water, used in mixing hydraulic cement compositions. No. 2,374,562. Calvin Owens.

Non-drying rust preventive base comprising: petrolatum (140-150° F. M. P.), petrolatum (150-165° F. M. P.), cylinder stock, viscous pale oil, wool fat, heavy metal salt of a high molecular weight fatty acid, alkyl ester of a high molecular weight fatty acid. No. 2,374,565. Harry Roden to The Texas Co.

Cement composition for cementing oil wells having properties of Portland cement except for retarded setting rate, said composition consisting of Portland cement and a bicarbonate to retard setting rate of said cement. No. 2,374,581. Levi Brown to Lone Star Cement Corp.

Hard, moisture-resisting, high melting point, fused, homogeneous wax-type composition composed of: hydrogenated castor oil, ester gum, petrolatum wax, and petroleum asphalt. No. 2,374,617. David Pearsall to The Engisn-Bickford Co.

Facilitating formation of a stabilized froth in fluidified mass of inert material, comprising mixing fluid mass consisting of pulverized earthy material, including fibrous material and a starch-included glue binder, introducing soluble rosin into mass, and maintaining mass alkaline while aerating mass. No. 2,374,626. Nathaniel Smith to Process Holdings Co.

Preparing Portland cement to retard setting rate thereof at elevated temperatures comprising distributing throughout dry cement 0.1% of mixture of dextrin and wheat flour. No. 2,374,628. Myron Swayze to Lone Star Cement Corp.

Preparing valve sealing and lubricating composition resistant to corrosive action of aluminum chloride. No. 2,374,650. Samuel Carney to Phillips Petroleum Co.

Purification of tall oil to improve color. No. 2,374,700. Arthur Pollak and Thomas Willingham to West Virginia Pulp and Paper Co.

Liquid emulsion having continuous phase which is a solution of a solid in a drying liquid, said solid being rupturable by marking pressures and having a discontinuous phase of a low-polarity oily liquid containing a marking chemical. No. 2,374,862. Barrett Green to The National Cash Register Co.

Preparing lubricating grease soap concentrate. No. 2,374,913. Alan Beerbower and John Zimmer to Standard Oil Development Co.

Treating emulsions of oil and water which comprises adding water-soluble sulfonated drying oil obtained from acid sludge of cracked naphtha by hydrolyzing sludge to recover hydrocarbons therefrom, etc. No. 2,374,917. Sam Bishkin to Standard Oil Development Co.

Active ingredient for insecticides comprising a synergistic combination of a rotenone-containing toxic agent and a partial ester of a neutral, low molecular weight polyhydroxylic organic compound. No. 2,374,918. Kenneth Brown to Atlas Powder Co.

Refining animal and vegetable oils which comprises neutralizing free fatty acids in said oil in presence of oil solvent to form mixture. No. 2,374,924. Benjamin Clayton to Refining, Unincorporated.

Solid wax composition comprising solid wax and mixed dispersing agent for wax comprising a lipophilic partial ester of a low molecular weight hydrophilic polyhydroxylic organic compound and a long chain fatty acid, and a highly hydrophilic hydroxy-polyoxyethylene ether of a lipophilic partial ester of a low molecular weight hydrophilic polyhydroxylic organic compound and a long chain fatty acid. No. 2,374,931. William Griffin to Atlas Powder Co.

Preparing fur for felting which consists in partially carroting fur by exposing the fur to radiation, infrared wave length within 6500 Å to 14,000 Å. No. 2,374,936. Alfred Hodshon and Harold Tucker to John B. Stetson Co.

Non-cohesive lubricating grease highly adhesive to metal surfaces for chassis parts of automobiles and crawler-type tractors comprising mineral oil, aluminum stearate, aluminum naphthenate, and organic amine. No. 2,374,966. John Zimmer and Arnold Morway to Standard Oil Development Co.

Solid dielectric element comprising in solid solution a mixture of 5-nitro, 3,4-dichloro-ortho-xylene, 3-nitro 4,5-dichloro-ortho-xylene, and per cent of nitro-prehnitene. No. 2,374,973. Burnard Biggs and Addison White and William Yager to Bell Telephone Laboratories, Inc.

Refining tall oil which includes heating tall oil in presence of a boron compound capable of removing visible or latent color bodies of said tall oil and subjected treated tall oil to a distillation operation. No. 2,374,975. Joseph Borglin to Hercules Powder Co.

Protecting wood and wood products from attack by termites which comprises impregnating terrain surrounding wood with a eutectic mixture of isomeric dichloro-mono-nitrobenzenes. No. 2,374,999. George Holbrook and Frank Kaufert to E. I. du Pont de Nemours & Co.

Ice color compositions containing dicyandiamide. No. 2,375,012. Paul McClellan and Walter Ericks to American Cyanamid Co.

Preparing lubricant additive which comprises reacting wool grease with phosphorus sesquisulfide, then saponifying it with crystalline barium hydroxide to saponify 50% of reaction product. No. 2,375,060. Norman Williams and William Backoff to The Pure Oil Co.

Lubricating oil comprising mineral oil and soap formed by saponifying with compound selected from compounds of tin and lead, 50% of product resulting from chemically reacting substance selected from nondrying animal and vegetable oils, fats and waxes with a phosphorus sulfide. No. 2,375,061. Norman Williams and William Backoff to The Pure Oil Co.

Controlling insect pests infesting vegetation, which comprises subjecting pests to insecticidal action of composition comprising mixture of nuclearly alkylated aromatic hydrocarbon sulfonates. No. 2,375,095. Lawrence Flett to Allied Chemical & Dye Corp.

Asphaltic composition in which normal penetration-softening point relationship of asphalt constituent has been altered without adversely affecting its weathering characteristics comprising asphalt with which there has been admixed boric acid. No. 2,375,117. Alfred Lentz to Richfield Oil Corp.

Producing sugar cane wax which comprises extracting material containing sugar cane wax with liquid sulfur dioxide. No. 2,375,142. Alfred Lee Sklar.

Recovery of betaine and betaine salts from sugar beet wastes by passing solution through a bed of granular hydrogen exchange material. No. 2,375,164. Arthur Bennett to The Great Western Sugar Co.

Testing fibers to determine minimum non-settling density thereof with respect to a pre-determined maximum impact. No. 2,375,182. Herman Anway to Wood Conversion Co.

Low ash content lubricating oil for high temperature internal combustion engines containing oil-miscible metal salt of condensation product of an aldehyde and an aromatic hydroxy compound to give high temperature detergent action, and oxidation-inhibiting quantity of an oil-soluble, sulfur-containing, organic compound. No. 2,375,222. John Griffin, Jr. and Paul Van Ess to Shell Development Co.

Non-volatile fluid ink comprising methyl violet dissolved in mixture of **butyl carbitol and a glycol, mixture has a surface tension between** 25 dynes and 40 dynes per centimeter. No. 2,375,230. Bernard Kline to The Western Union Telegraph Co.

Making a waterproof felted sheet. No. 2,375,244. Paul Pretzel.

Making nodulated mineral wool comprising forming felted layer of mineral wool fibres with a binder disseminated therethrough. No. 2,375,284. Harold Coss to Johns Manville Corp.

Water repelling composition comprising a water emulsion resulting from mixture of Japan wax, aluminum stearate, uncooked and unpolymerized China-wood oil, water-soluble A-stage ureaformaldehyde resin, ammonium hydroxide and a hydrocarbon solvent and said ammoniacal base reacting with free fatty acids in mixture to form a thermo-labile soap acting as active emulsifier. No. 2,375.348. Jesse Cohen, fifteen per cent to Joseph Heller.

Insecticidal composition comprising tetranitrocarbazole and an inert extender. No. 2,375,382. Kaspar Pfaff, Michael Erlenbach and Walter Finkenbrink, Hans Maier-Bode, Kreis Bitterfeld, Kurt Meisenburg and Marianne Meisenheimer to Winthrop Chemical Co. Inc.

Making artificial fiber insulation board which comprises forming slurry of vegetable fibers into a wet mat, applying emulsion consisting of setting and hardenable drying oil together with drier therefor to surface of wet mat, etc. No. 2,375,450. Henry Walter to Wood Conversion Co.

Turret lubricating grease, comprising calcium stearate, aluminum stearate, lead oleate, and mixture of neutral mineral oil and naphthenic oil. No. 2,375,485. John Morgan and Russell Lowe to Cities Service Co.

Fluxing agent for production of iron and steel, consisting of a bonded mixture of particles of limestone with cement and calcium hydrate. No. 2,375,520. James Bowden and John Suda.

Lubricant comprising hydrocarbon oil and an oil-soluble metal derivative of thermally extracted cashew nut shell oil. No. 2,375,579. John Patterson and Rush McCleary to The Texas Co.

Solid, highly adhesive compositions having flow points ranging from 50° C. to 55° C. and consisting of decachlor diphenyl benzene and chlorinated diphenyl containing 54 to 60% chlorine. No. 2,375,623. Frank Clark to General Electric Co.

Halogenated composition for electrical insulating purposes which is soft and semi-solid at 25° C. comprising crystalline chlorinated diphenyl benzene and crystalline chlorinated diphenyl oxide, containing about 60 per cent chlorine. No. 2,375,624. Frank Clark to General Electric Co.

Soap stabilized against discoloration and rancidity by presence of a biguanide salt of a p-tertiary amylphenyl phosphoric acid. said soap being an alkali metal salt of a fat acid. No. 2,375,626. Elmer Cook to American Cyanamid Co.

Preparating of paving materials which comprises incorporating in a bituminous material oleyl amine, $C_{18}H_{35}NH_2$, and bonding a mineral aggregate with said composition. No. 2,375,653. August Holmes to Standard Catalytic Co.

Laundry sour composition comprising dry mixture containing ammonium chloride, magnesium carbonate to prevent development of excess acidity upon dispersion of composition in water, and water-soluble acid-reacting compound selected from acid-reacting fluorides and oxalic acid. No. 2,375,664. Adolph Klancnik and Frank Klancnik.

Making an aquasol containing colloidal silica and water. No. 2,375,738. John White to Monsanto Chemical Co.

*Coatings

Coating composition and method of making same using mixture of rosin and tall oil with lime. No. 2,373,709. William Rice.

Enteric coating comprising, myristic acid, hydrogenated castor oil, castor oil, cholesterol, and sodium taurocholate. No. 2,373,763. Rudolph Kuever and Paul Maney to the State of Iowa for the use and benefit of the State University of Iowa.

Corrosion preventing coating composition consisting of petroleum wax, petroleum oil, and magnesium stearate, to impart to coating composition the desired penetration-consistency relationship. No. 2,373,787. Thomas Sharp to Standard Oil Co.

Providing with reflective backing a granular fluorescent coating applied to an extended wall surface. No. 2,374,310. Vincent Schaefer to General Electric Co.

Coating material for plastics comprising nitrocellulose as film forming substance, solvent medium for nitrocellulose including mesityl oxide and additional solvent selected from butyl acetate, amyl acetate, ethyl acetate, etc., solvent for softening surface of plastic to which material is applied composed of nitro paraffin and toluol, and agent for bonding film forming substance to softened plastic surface, selected from methyl phthalyl ethyl glycollate, ortho-toluene, etc. No. 2,374,603. Stanislav Kolar and Alexander Sternberg to Allied Finishing Specialties Co.

Making water-proof surfacing which comprises forming dispersion of morpholine compound of a glyceride oil in liquid surfacing medium, forming a film from dispersion and then heating film to drive off morpholine. No. 2,374,678. Louis Gruenwald.

Coating basis metals with a protecting coating, which comprises pretreating basis metal of ferrous metal, copper and nickel, by charging it with a reducing gas, of hydrogen, carbon monoxide, nitrogen, blast furnace gas and blue water gas, and a halogen acid of hydrochloric, hydrobromic, hydroiodic and hydrofluoric acids, and, introducing said basis metal to be coated into a normal molten bath of tin, cadmium, zinc, lead and beryllium, a wetting characteristic being imparted to said basis metal by its gas charge so that it takes a continuous coating of coating metal. No. 2,374,926. Colin Fink.

Bituminous coating composition comprising bitumen and oil-soluble, water-insoluble polyvalent metal soap of a high molecular weight acid and surface active eompound which is oil-soluble and partially water-soluble. No. 2,375,055. Bruce Weetman and Robert Jamieson to The Texas Co.

Coating paper which comprises maintaining molten bath of bismuth, tin and cadmium in container, maintaining a layer of high melting point wax on top of bath at inlet end of container, and passing a web through layer of wax and molten bath. No. 2,375,360. Walter Herrick to Riegel Paper Corp.

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

From Official Gazette—Vol. 574, Nos. 3, 4, 5—Vol. 575, No. 1 (May 15-June 5)—p. 593

Composition consisting of acid phosphate coating chemicals and an organic compound which contains the nitro group to act as an accelerator. No. 2,375,468. Wilfred Clifford and Henry Adams to Parker Rust-Proof Co.

Coating lacquer composed of polystyrene and a solvent of equal parts of 2-nitropropane, acetylene, tetrachloride, toluene and butyl ethylene glycol ether acetate. No. 2,375,701. Thomas Smith to The Maytag Co.

*Dyes, Stains

Monoazo dyestuffs. No. 2,373,693. Arthur Knight and William Stephen to Imperial Chemical Industries Ltd.

Azo compounds and material colored therewith. No. 2,373,700. James McNally and Joseph Dickey to Eastman Kodak Co.

Dyestuff identical with that obtained by aluminum chloride condensation of 4'-benzoylamino-6:5-(N)-benzacridone-1'-1-dianthrimide in nitro benzene which is a dark brown powder soluble in concentrated sulphuric acid with a red color and which dyes cotton from an alkaline hydrosulphite vat in bordeaux brown shades. No. 2,373,817. William Dettwyler to E. I. du Pont de Nemours & Co.

Azo dyestuffs. No. 2,373,926. Joseph Trepagnier to E. I. du Pont de Nemours & Co.

Manufacture of tetrakisazo dyestuffs. No. 2,374,063. William Williams to E. I. du Pont de Nemours & Co.

Azo pigments. No. 2,374,064. Harold Woodward to E. I. du Pont de Nemours & Co.

Process for dyeing nylon in which nylon is dyed with a metallized monoazo dye which when applied to nylon is in water insoluble form. No. 2,374,106. Donovan Kvalnes and Boyce Carson to E. I. du Pont de Nemours & Co.

Red monazo wool dyes. No. 2,374,157. Donovan Kvalnes to E. I. du Pont de Nemours & Co.

Monoazo dyestuffs. No. 2,374,158. Arthur Knight and William Stephen to Imperial Chemical Industries Ltd.

Increasing stability of a diazo-type light-sensitive layer containing a suitable diazo compound which comprises adding to coating solution a member of the class consisting of saturated and unsaturated gamma lactones. No. 2,374,563. Maximilian Reichel to General Aniline & Film Corp.

Methine dyestuffs. No. 2,374,880. Willy Mueller to Society of Chemical Industry in Basle.

Mono-sulfonic acids of asymmetrical urea-like diazo-dyestuffs. No. 2,375,561. Otto Kaiser to Society of Chemical Industry in Basle.

*Explosives

Making explosives, comprising, agitating nitrocellulose and water-immiscible solvent therefor in an aqueous bath, etc. No. 2,375,175. Charles Silk to Olin Industries, Inc.

*Foods

Confection composition in which a solid comminuted material is dispersed in a fatty carrier, said composition also containing a phosphatidic material comprising methylated cephalin. No. 2,373,687. Percy Julian, Edwin Meyer, and Herbert Iveson to American Lecithin Co.

Sugar product comprising sucrose crystals intergrown with and isolated by dextrose crystals. No. 2,373,919. Mitchell Schweiger to J. D. & A. B. Spreckels Co.

Treating fresh whole fruit for cleaning and disinfecting and immunizing same against decay, which comprises contacting fruit with aqueous solution containing a detergent, a water soluble salt of hydroxy diphenyl, and tetra sodium pyrophosphate. No. 2,374,209. Arthur Kalmar to Food Machinery Corp.

Protecting fresh whole fruit from decay which comprises: contacting fruit with aqueous solution of hypochlorite of an alkali forming metal, and contacting fruit with solution containing reducing agent selected from phosphites, sulphites, bisulphites, etc. and also containing water soluble salt of hydroxy diphenyl and buffer. No. 2,374,210. Arthur Kalmar to Food Machinery Corp.

Preserving food juice which consists in dispersing therein organic sterilizing solvent, and then simultaneously evaporating solvent from sterilized juice and drying the juice. No. 2,374,219. Royal Lee to Lee Foundation for Nutritional Research.

Food of high nutritive value comprising proteins of cow's milk in proportions to each other in which they are normally present in cow's milk and admixed sources of cystine and tryptophane, providing 1 to 3 parts of cystine and 0.2 to 1 part of tryptophane for 100 parts of said proteins. No. 2,374,407. Richard Block and Arthur Hellwig to C. M. Armstrong, Inc.

Making homogenized milk including pasteurizing milk, neutralizing milk with agent selected from calcium oxide and magnesium oxide, homogenizing milk so treated, adding a lactic acid-producing starter, and then cooling milk. No. 2,374,427. Ernest Fear, thirty per cent to Irving Fear and 20 per cent to Helendoris Murphy.

Treating a vitamin A and D concentrate to separate vitamin A from vitamin D, which comprises esterifying vitamin A to exclusion of vitamin D with acylating agent selected from anhydrides and acyl halides of aromatic acids and aliphatic dicarboxylic acids, etc. No. 2,374,470. Loran Buxton to National Oil Products Co.

Treating a vitamin A and D concentrate to separate vitamin A from vitamin D. No. 2,374,471. Loran Buxton to National Oil Products Co.

Production of riboflavin, which comprises subjecting carbohydrate free nutrient mash containing metabolizable lipid and proteinaceous material to action of a culture of the fungus Eremothecium ashbyii. No. 2,374,503. Frank Rudert to Commercial Solvents Corp.

Processing edible material which contains fermentable ingredient to produce product which is stabilized against undesired fermentation and bacterial decomposition, which comprises subjecting material, to action of monohalogen-acetic acid esters of a monohydroxy aliphatic carboxylic acid, etc. No. 2,374,620. Martin Prinz.

Preparation of vitamin E or tocopherols. No. 2,375,078. John Cawley to Distillation Products, Inc.

Preparing dry vitamin food product devoid of oiliness, which consists in comminuating raw fish livers having difficulty removable oil content and admixing livers with dry, comminuted hydrophilic vegetable material. No. 2,375,278. Loran Buxton to National Oil Products Co.

Vitamin-fortified product comprising oil-free vegetable particles bearing a fat-soluble vitamin and each particle having outer protective film composed of gelatin and hydrophilic substances derived from said vegetable particles. No. 2,375,279. Loran Buxton and Andre Briod to National Oil Products Co.

Edible preparation in dry powder form containing vitamin A in which stability of vitamin A potency is high, comprising residue of water insoluble constituents of macerated animal livers. No. 2,375,501. Boris Sokoloff to World Products Corp.

Selectively removing caffeine from coffee extract which comprises contacting extract with a silicate from class of aluminum and magnesium. No. 2,375,550. Harold Grossman.

Polymerizing dextrose which comprises: heating crystalline dextrose as large crystals in contact with catalytic material comprising pulverulent compound of boric anhydride and tetra, meta and ortho boric acids. No. 2,375,564. Gerald Leuck to Corn Products Refining Co.

*Fine Chemicals

Concentrating carotene. No. 22,629. Harold Barnett.

New sulphonamide derivative, N-(para-amino-benzene-sulphonylyl)-2-allyl-4-amino-1-naphthol. No. 2,373,658. Gordon Butler, Ezra Lozinski and Arthur Odell to Charles E. Frosst & Co.

Methylated cephalin. No. 2,373,686. Percy Julian, Edwin Meyer, and Herbert Iveson to American Lecithin Co.

Polymerizing indene free from coumarone by contacting said indene with a catalyst selected from alkyl and aryl acid sulfates. No. 2,373,714. Frank Soday to The United Gas Improvement Co.

Preparing triarylamino substitution derivatives of cyanuric chloride. No. 2,373,826. Donald Graham to E. I. du Pont de Nemours & Co.

Disodium N-(beta-hydroxyethyl) imino-bis-(methane-sulfonate). No. 2,373,870. Donald Coffman and Witty Alderson, Jr. to E. I. du Pont de Nemours & Co.

Manufacturing hydroquinone wherein quinone is reduced to hydroquinone in acid aqueous medium by action of acid on a metal added to medium, and hydroquinone resulting is extracted by agitating with inert liquid water insoluble organic solvent. No. 2,373,887. Bruce Gralow to E. I. du Pont de Nemours & Co.

Beta-erythroidine and its hydrohalides, and a process for their production. No. 2,373,952. Karl Folkers and Randolph Major to Merck & Co., Inc.

Salts of beta-erythhroidine. No. 2, 373,953. Karl Kolkers and Randolph Major to Merck & Co., Inc.

Obtaining concentrates suitable for nutritional or therapeutic uses, comprising cutting a food or forage crop while growing, and applying a pressure of over 1,000 pounds per line inch of width of material, etc. No. 2,374,047. Matthew Stacom to Stacom Process Corp.

Production of furan which comprises bringing vapor mixture of furfural and steam into contact with a catalyst selected from dehydrogenating oxides. No. 2,374,149. Gerald Whitman to E. I. du Pont de Nemours & Co.

Hydroxytetrahydronorpolycyclopentadienes. No. 2,374,173. Herman Bruson to The Resinous Products & Chemical Co.

Morpholine compounds. No. 2,374,181. Joseph Dickey and James McNally to Eastman Kodak Co.

1-Phenoxy-3-hydroxy-propanones-(2) and process for their manufacture. No. 2,374,283. Adolf Grun and Willy Stoll to J. R. Geigy A. G.

Esters of gamma-acetyl-gamma-methyl-pimelic acid. No. 2,374,327. Herman Bruson to The Resinous Products & Chemical Co.

Triazole derivatives. No. 2,374,335. Gaetano D'Alelio to General Electric Co.

Arylene diamine compounds. No. 2,374,337. Joseph Dickey and James McNally to Eastman Kodak Co.

Preparation of hexamethylene diisocyanate. No. 2,374,340. Mark Farlow to E. I. du Pont de Nemours & Co.

Preparing polymeric amino di-imidazolines which comprises reacting a bi-functional condensing agent with a preformed amino di-imidazoline. No. 2,374,354. Saul Kaplan to The Richards Chemical Works.

Acetylating alkyl lactates which comprises reacting alkyl lactate and acetic anhydride by continuously introducing lactate and acetic anhydride into a continuous still, and recovering alkyl alpha-acetoxypropionate from still. No. 2,374,428. Charles Fisher and Martin Fein to Secretary of Agriculture of the United States of America.

Manufacture of isoalloxazine derivatives. No. 2,374,661. Franz Bergel and John Haworth to Roche Products Ltd.

Compounds of the cyclopentanopolyhydrophenanthrene series and methods of their preparation. No. 2,374,680. Willard Hoehn to George Breon & Co., Inc.

Dehalogenating halides of steroid series containing halide groups attached to adjacent carbon atoms which comprises treatment with halide salt selected from chromous, vanadous, or titanous chlorides. No. No. 2,374,683. Percy Julian, John Cole, Arthur Magnani, and Harold Conde to The Glidden Co.

Preparing 1,2,3,4-tetrachloropentane from a light oil piperylene fraction containing up to 90% by weight of piperylene and other conjugated diolefine material. No. 2,374,711. Frank Soday to The United Gas Improvement Co.

Acylamines of anthraquinone series and a process for their manufacture. No. 2,374,891. Albin Peter to Sandoz A. G.

New capillary active substance the sndium salt of the di 3-capryloylaminobenzene-sulf)-imide. No. 2,374,934. Winfrid Hentrich and Erik Schirm and Heinz-Joachim Engelbrecht.

Dialkylaminoalkanol ester of a p-aryloxy-methylbenzoic acid. No. 2,375,138. Victor Salvin and Arthur Hill to American Cyanamid Co.

Direct conversion of alipthatic, cycloaliphatic and arylaliphatic halides to esters of carboxylic acids. No. 2,375,301. Robert Joyce, Jr. to E. I. du Pont de Nemours & Co.

Production of trichloroacetonitrile and its polymers, passing over active carbon catalyst impregnated with compound selected from zinc halide, copper halide and alkaline earth metal halides, a mixture comprising chlorine and acetonitrile. No. 2,375,545. Reginald Foster to Imperial Chemical Industries Ltd.

Preparation of esters of aconitic acid. No. 2,375,563. Philip Kirk to American Cyanamid Co.

Polyhyroxyacetylated high molal detergent-forming monocarboxy acid compound. No. 2,375,606. Arthur Wirtel to Petrolite Corp. Ltd.

Converting amidoxime to a corresponding amidine by reducing the =NOH group of amidoxime to imino group, which comprises hydrogenating amidoxime in presence of a metal hydrogenation catalyst. No. 2,375,611. Harry Barber and Alan Henderson to May & Baker Ltd.

Ester of alpha-hydroxy isobutyric acid. No. 2,375,629. Gaetano D'Alelio and James Underwood to General Electric Co.

Alkylation process which comprises reacting acyclic monoolefin with paraffin hydrocarbon in presence of sulfuric acid of alkylating strength

* Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.

and containing admixed therewith element of group VIA of periodic system. No. 2,375,637. Carleton Ellis, deceased, by Carleton Ellis Jr. and Bertram Ellis, and Bank of Montclair, executors; said Carleton Ellis to Standard Oil Development Co.

Alkoxypropylamine condensation products. No. 2,375,659. Louis Jones and Walter Ericks to American Cyanamid Co.

Producing cumene which comprises contacting diisopropyl ether with a solid phosphoric acid catalyst, etc. No. 2,375,724. John Anderson and Edwin Bullard to Shell Development Co.

Preparation of dithioammelide. No. 2,375,733. Donald Kaiser to American Cyanamid Co.

Producing 2-amino pyrimidine which comprises mixing together under anhydrous conditions a guanidic salt, a beta alkoxyacrolein acetal, an anhydrous alcohol, and hydrogen chloride. No. 2,375,735. Anthony Moos and Robert Price to Lederle Laboratories, Inc.

Equipment

Apparatus for saponification of a liquid and for solvent extraction of non-saponifiable component thereof. No. 2,373,646. Donald Binnington to General Mills, Inc.

In apparatus for vaporizing and dispensing liquefied petroleum gas, a storage tank under pressure; a collecting and vaporizing chamber buried in the earth, etc. No. 2,373,683. John Holicer.

Heater for liquids. No. 2,373,759. Avinoam Hourvitz.

Continuous vulcanizing apparatus including a vulcanizing chamber and means for supplying a condensable vulcanizing medium under high pressure to vulcanizing chamber, etc. No. 2,373,816. Daryl DeRoche and Donald Jones to Western Electric Co., Inc.

Apparatus for heating a material to temperatures above 1000° F. No. 2,373,845. Charles Norton, Jr. to The Babcock & Wilcox Co.

Method and apparatus for moisture measurement of materials by measuring conductivity of material. No. 2,373,846. Hyman Olken.

Cup-like metal foil closure including flexible coating adhering to inner surface of metal foil, said coating comprised of a wax-miscible, lacquer-like vehicle base and a wax miscible therein. No. 2,373,847. Andrew Osborne and Thomas Hill to Aluminum Co. of America.

Apparatus for conducting catalytic reactions consisting of in combination, a plurality of catalytic reaction chambers, conduits for conducting a stream of reactants to each of said chambers, etc. No. 2,373,888. Karl Hachmuth to Phillips Petroleum Co.

Apparatus for indicating film-forming ability of solutions and slurries on metallic materials. No. 2,374,088. Marselio Fontana, Gordon Kidder and Philip Kraus to E. I. du Pont de Nemours & Co.

Filtration apparatus. No. 2,374,094. Frank Harvut to S. F. Bowser & Co., Inc.

Apparatus for geochemcial surveying comprising a molecular still for desorbing hydrocarbons from a soil sample, trap connected to said melocular still for trapping hydrocarbons desorbed from said soil sample, etc. No. 2,374,135. Edwin Roper to Stanolind Oil & Gas Co.

Regulating the passage of gases in heat exchangers. No. 2,374,178. David Dalin.

Mass spectrometry. No. 2,374,205. Edmund Hoskins to Consolidated Engineering Corp.

Heat exchanger for cooling stream of liquid and having casing provided with air inlet and an air outlet, etc. No. 2,374,208. Russell Jones, Jr. to Niagara Blower Co.

Desiccating apparatus. No. 2,374,232. David Pfeiffer and Joseph Hill.

Apparatus for production of acetylene and carbon black by the pyrolysis of hydrocarbon gases and vapors. No. 2,374,252. William Wilcox, deceased, by Mary Wilcox, executrix, to Oil and Gas Research, Inc.

Proportioner for introducing solution of foam-forming material into a continuously flowing stream of water. No. 2,374,516. Evert Wendell to National Foam System, Inc.

Apparatus for evaporating and distilling. No. 2,374,519. Eugene Worthen to Buena Vista Iron Co.

Apparatus for distillation and fractionation. No. 2,374,549. Wallace McMillan to The Texas Co.

Pulverulent materials-handling and storage system. No. 2,374,584. Curtis Cannon to Shell Development Co.

Glow discharge lamp which has an ionizable gaseous filling and spaced cold electrodes. No. 2,374,677. Ladislas Goldstein and Francis Perrin to Canadian Radium & Uranium Corp.

Apparatus for suspending in atmosphere an ultra-dispersed fluid or a dry powered product. No. 2,374,699. Emile Piquerez.

Apparatus and process for tapering artificial filaments. No. 2,374,744. John Gregory to Pittsburgh Plate Glass Co.

High pressure portable oxygen cylinder or like resistant to fragmentation from external impact when highly stressed with internal fluid pressure. No. 2,374,771. Howard Needham to A. O. Smith Corp.

Heater for fluids comprising a furnace having a radiant heating section and a convection heating section in vertical alignment, etc. No. 2,374,797. Marion Barnes to Universal Oil Products Co.

Gravity separator for comminuted materials. No. 2,374,865. Mack Haworth to Roberts & Schaefer Co.

In high vacuum molecular distillation apparatus, a vertically disposed fractionating column of the reflux type, etc. No. 2,374,870. Charles Litton, one-fourth to Jesse Markel and one-fourth to Alexander Poniatoff.

Crude oil treating apparatus. No. 2,374,944. Glenn Mawhirter.

Fractionating tower, vertically spaced plates in said tower, a plurality of fractionating elements in each of said plates, etc. No. 2,374,950. John Packie and Lester Gibbs to Standard Oil Development Co.

Filtering apparatus. No. 2,374,953. Joseph Pickard to The Metafiltration Co. Ltd.

Clarifying apparatus comprising a chamber having an apertured wall, a plurality of filter elements extending through said apertures, etc. No. 2,374,976. Southwick Briggs, Walter Bauer and Walter Ewbank; said Bauer and said Ewbank to Briggs Clarifier Co.

Fractionating narrow boiling vapor mixture comprising components of greater and lesser solubility in a selective liquid solvent in extraction system. No. 2,374,984. Theodore Evans and Rupert Morris to Shell Development Co.

Apparatus for high temperature tensile testing of materials in vacuo. No. 2,375,034. Marion Semchyshen to Climax Molybdenum Co.

Liquid-level measuring apparatus, a measuring unit comprising an electric condenser portion and a capacitance measuring portion, etc. No. 2,375,084. Samuel Coroniti and Willy Schmidt to General Aniline & Film Corp.

Method and apparatus of producing a continuous supply of molten metal of desired analysis. No. 2,375,107. Robert Hopkins to The M. W. Kellogg Co.

In electric resistance heating furnace, a resistance wire comprising a molybdenum core and a platinum sheath thereon. No. 2,375,154. Renzo Volterra to Metals & Controls Corp.

Dust separator. No. 2,375,203. William Appeldoorn.

Reconditioning spark plug that has been operated on leaded gasoline which includes cleaning deposits from spark plug and treating with a phosphorus compound. No. 2,375,218. Arthur Fry and Lloyd Withrow to General Motors Corp.

Bearing containing 1-20% of thallium, balance predominantly silver. No. 2,375,224. Franz Hensel to P. R. Mallory & Co.

Known type of edge-filtration filter-pack composed of series of registered face-to-face contacting layers of an uneven-surface material, pores of which are closed by impregnating-agent unaffected by medium to be filtered, improvement of a cementitious-medium adhering contacting surfaces of said layers together to constitute a unit. No. 2,375,246. Walter Kasten to Ralph Skinner.

Amalgamator comprising stationary cylindrical mortar having a cylindrical cavity and provided with a bottom wall having central upstanding cone and concave annular surface surrounding said cone, etc. No. 2,375,254. Joseph Shannon.

Apparatus for separating suspended particles from liquids, comprising closed tank for holding within upper portion gas at sub-atmospheric pressure and within lower portion ever-changing body of liquid undergoing treatment while exposed to overlying gas, etc. No. 2,375,282. Robert Clemens to The Dorr Co.

Packing for liquid and vapor contacting apparatus arranged to provide a plurality of cells disposed in superposed relationship, each cell being composed of two similar elements of capillary material disposed base to base, etc. No. 2,375,336. Alfred Weitkamp to Standard Oil Co.

Brinell hardness testing device. No. 2,375,341. James Bishop and Lloyd Babcock to The National Supply Co.

Thermoplastic gasket for use between body and closure of a container to seal joint therebetween, comprising ring formed from polyvinyl acetal resin in which 60% of available hydroxyl groups are reacted with aldehyde, high boiling point low vapor pressure hydrolysis resisting plasticizer, and finely divided filler. No. 2,375,388. Joseph Ryan to Libbey-Owens-Ford Glass Co.

Dispensing container for viscous material comprising a bowl member and a cover member assembled for relative rotation. No. 2,375,430. James Mason, Burton Craig and Jack Garvin.

Apparatus for copper coating ferrous metal strip. No. 2,375,434. Bolton Moise and Bolton Moise, Jr.

Apparatus for removing slag from a pressure fired furnace. No. 2,375,436. Walter Noack to Aktiengesellschaft Brown, Boveri & Cie.

Apparatus for applying coatings to glass containers to improve characteristics thereof, comprising a chamber for moisture-absorbing material, a chamber for an inorganic liquid coating material, etc. No. 2,375,482. Aaron Lyle to Hartford-Empire Co.

Apparatus for coating tape or the like. No. 2,375,493. Robert Randall to Reiss Manufacturing Corp.

Rotary lime treating apparatus. No. 2,375,499. Claire Shigley to The Dow Chemical Co.

Apparatus for heating inflammable gas stream. No. 2,375,500. Leonard Silver and Michael Maccormac to The Gas Light and Coke Co.

Apparatus for producing form of pig iron of low carbon content. No. 2,375,510. Amos Denison Williams.

Dispenser for latex comprising tubular body having dispensing aperture, ball valve for said aperture, etc. No. 2,375,515. Austin Beaumier.

Dust collector having horizontal upper and lower walls and vertical side and end walls, etc. No. 2,375,608. George Young to B. F. Sturtevant Co.

Combustion apparatus comprising a wall having a passage therethrough, an air chamber adjacent the outer end of said passage, etc. No. 2,375,625. Leon Conway to Frederick Bloom.

Apparatus for distilling liquids comprising enclosed container for liquid to be distilled, a condenser, a compressor having low pressure cylinder and plurality of high pressure cylinders. No. 2,375,640. Reginald Clarence Ford.

Apparatus for separating minerals and like from sea water comprising a closed casing forming a vaporizing chamber and having a reduced outlet in top thereof, a pressure line, etc. No. 2,375,713. Hayes Weidner.

Apparatus for dissolving solid material in a solvent comprising cylindrical vessel, a tubular outlet member extending into said vessel adjacent wall and parallel to axis thereof having a plurality of screening openings along its extent, etc. No. 2,375,729. William Caldwell to American Cyanamid Co.

Apparatus for conducting chemical reactions in liquid phase under pressure comprising a series of elements connected in a circuit for successive functioning in continuous flow. No. 2,375,730. William Caldwell, Robert Swain and Joseph Paden to American Cyanamid Co.

Photographic flash lamp comprising oxygen-filled bulb having ignitible primer therein, and supporting medium adjacent to primer coated with a dried paste comprising Zr 95%. KC104 3.75% and MgO_3 1.25%. No. 2,375,742. Emil Kalil and William Gleim to Wabash Appliance Corp.

**Industrial Chemicals, Organic*

Producing chlorine dioxide by reacting a metallic chlorate with a gaseous reducing agent in aqueous solution acidified in advance with any strong acid, with exception of halogenic acids. No. 2,373,830. Torsten Gustaf Holst.

Producing anhydrous sodium sulfate from a hydrated sodium sulfate. No. 2,374,004. David Ebert to American Viscose Corp.

Preferentially oxidizing all of elemental phosphorus and not more than a small proportion of carbon monoxide in a phosphate reduction furnace gas from an electric furnace. No. 2,374,188. George Frear to Tennessee Valley Authority.

Manufacture of anhydrous sodium sulphate by calcining a mixture of sodium bisulphate and sodium chloride, etc. No. 2,374,285. Max Harbaugh to E. I. du Pont de Nemours & Co.

Preparing acid solution of ferrous sulphate having a pH of 1-3. No. 2,374,453. Thomas Oliver and Ralph Long and Leo Crosson to Charlotte Chemical Laboratories, Inc.

Determining a mechanical axis of a quartz crystal. No. 2,374,543. Gerald James Holten.

Separating calcium values existing as calcium hydroxide from magnesium values associated therewith in product resulting from slaking mixture

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

From Official Gazette—Vol. 574, Nos. 3, 4, 5—Vol. 575, No. 1 (May 15-June 5)—p. 595

of oxides of calcium and magnesium. No. 2,374,632. George Walker to Warner Co.

Production of manganese dioxide by thermal decomposition of manganese nitrate. No. 2,374,674. Abraham Fox and Carl Chindgren to the Government of the United States as represented by the Secretary of the Interior.

Production of well-formed, easily filterable crystals of hemibasic calcium hypochlorite having formula Ca (OC1) 2. 1/2 Ca (OH) 2, which comprises mixing neutral calcium hypochlorite and dibasic calcium hypochlorite. No. 2,374,835. Homer Robson to The Mathieson Alkali Works, Inc.

Manufacturing a mixed crystal crop, which comprises adding to solution containing mainly sodium chloride, the ingredients potassium chloride, borax and water and then carbonating resulting sludge, ingredients added and carbon dioxide absorbed being in proportions suitable for forming potassium pentaborate octohydrate and sodium bicarbonate. No. 2,374,877. Frank May to American Potash & Chemical Corp.

Logging a borehole which comprises collecting samples of soil at spaced intervals along borehole, analyzing each sample for its content of ionizable inorganic salts and the component ions thereof. No. 2,374,-937. Leo Horvitz to Esme Rosaire.

Manufacture of sodium sulphate and chlorine reacting sulphur trioxide and sodium chloride. No. 2,375,000. Ralph Iler to E. I. du Pont de Nemours & Co.

Manufacture of chlorine and sodium sulphate which comprises causing sulphur trioxide to act on sodium chloride so that products are sodium sulphate, sulphur dioxide and chlorine. No. 2,375,001. Ralph Iler to E. I. du Pont de Nemours & Co.

Manufacture of chlorine and sodium sulphate which comprises heating oleum to drive off sulphur trioxide, etc. No. 2,375,002. Ralph Iler and Francis McAdam to E. I. du Pont de Nemours & Co.

Manufacture of chlorine. No. 2,375,011. Francis McAdam to E. I. du Pont de Nemours & Co.

Cyclic process for crystallizing trisodium phosphate in which content of soluble silica compound tends to build up to undesirable levels due to recirculation of mother liquor, precipitating soluble silica by incorporating sodium aluminate in contaminated liquor. No. 2,375,054. Myron Waddell to E. I. du Pont de Nemours & Co.

Purifying calcium contaminated with sodium which comprises heating calcium in absence of air to distill sodium but not calcium, selectively oxidizing resulting sodium vapor by bringing it in contact with zirconium oxide. No. 2,375,198. Peter Alexander to Metal Hydrides Inc.

Purification of barium. No. 2,375,200. Peter Alexander to Metal Hydrides, Inc.

Purification of strontium. No. 2,375,201. Peter Alexander to Metal Hydrides Inc.

Titanium concentrate containing alumina, lime, titanium oxide. No. 2,375,268. Lewis Wyckoff to Electro Metallurgical Co.

Manufacture of selenium rectifiers, comprising adding iodine to selenium, then transforming latter into good conductive crystalline modification and treating surface of iodine-containing selenium layer by inorganic fluids which attack and remove iodine present in surface of selenium. No. 2,375,353. Torwald Ekenas and Gustaf Fahraeus to Bolidens Gruvaktiebolag.

Treating selenium surface, after selenium has been transformed into crystalline modification, with reagent having etching effect on selenium surface and selected from chlorine and bromine. No. 2,375,355. Gustaf Fahraeus, Axel Lindblad and Sven Wallden to Bolidens Gruvaktiebolag.

Producing a water soluble phosphorus-boron containing composition which comprises reacting boric acid with phosphorus pentoxide in presence of a reaction product of water and phosphorus-pentoxide. No. 2,-375,638. Leonard Englund.

Producing artificial filaments, threads, films and like which consists in reacting alkaline earth metal alginate with aqueous solution of alkali metal salt thereby producing mixture of alkali metal alginate in water having therein finely divided particles of alkaline earth metal salt, and extruding mixture into a setting medium. No. 2,375,650. Horace Hegan and John Givens to Courtaulds Ltd.

Preparing barium aluminate which comprises heating mixture consisting of a barium sulfate material and an aluminum oxide material. No. 2, 375,715. Francis Williams to National Lead Co.

Industrial Chemicals, Organic

Organic sulphonates and method of making. No. 2,373,643. Leland Beckham to The Solvay Process Co.

Mineral oil composition comprising mineral oil and product produced by **treating organic phosphorus halide ester with a Wurtz-Fittig catalyst to** remove halide from ester, said reaction product comprising diphosphorus esters. No. 2,373,670. Ernest Engelke to Cities Service Oil Co.

Formation of amines by catalytic reaction of hydrogen and an aliphatic aldehyde with an aminating agent chosen from ammonia and aliphatic amines having an unsubstituted hydrogen atom. No. 2,373,705. John Olin and Edward Schwoegler to Sharples Chemicals Inc.

Preparing solid copolymer of a terpene and isobutene. No. 2,373,706. Emil Ott to Hercules Powder Co.

Recovery of diolefins from a mixture containing at least one diolefin comprising contacting with finely divided metals. No. 2,373,715. No Drawing.

Producing pentaerythritol involving condensation of acetaldehyde with formaldehyde in presence of alkaline earth alkali. No. 2,373,717. George Spiller to Hercules Powder Co.

Composition for application to surfaces exposed to deposition of ice to reduce formation and accretion of ice thereon comprising ethylene glycol, gelatin, gum tragacanth, water, soap and mineral oil. No. 2,373,-727. Harry West and Alexander Ogston to Intava Ltd.

Soluble mixture of a solid, difficultly soluble formaldehyde polymer and hexamethylenetetramine to render composition soluble. No. 2,373,777. Oscar Peterson to E. I. du Pont de Nemours & Co.

Preparation of poyvinyl ethers, which comprises reacting alkyl halide with alkali metal alcoholate of a polyvinyl alcohol in liquid ammonia as reaction medium, whereby to form corresponding polyvinyl alkyl ether, and isolating said ether. No. 2,373,782. Robert Scheiderbauer to E. I. du Pont de Nemours & Co.

Preparation of cellulose esters of lower monocarboxylic saturated fatty acids of increased stability. No. 2,373,786. George Seymour, Mervin Martin and Robert Rowley to Celanese Corp. of America.

Recovery of aromatic sulphonic acids from aqueous sulphonation reaction mixture resulting from sulphuric acid treatment of aromatic hydrocarbon oils resulted from an oil-cracking operation. No. 2,373,793. Alfred Susie to Fuel Research Development Corp.

Purifying phosphoric acid esters used for dephenolizatinn of waste aqueous liquors and freed from phenols, which comprises mixing esters with absorbent lignite coke or active charcoal to absorb esters and impurities contained therein and extracting esters by means of a solvent for esters which has a low solvent power toward asphalts. No. 2,373,807. Hermann Beeg and Rudolf Schmidt.

Complex dithiophosphoric acid esters. No. 2,373,811. Elmer Cook and William Thomas, Jr. to American Cyanamid Co.

Phosphite esters of a sulphurized mixture of pure aliphatic unsaturated alcohols, containing eight to eighteen carbon atoms in molecule used in lubricating oils. No. 2,373,879. Melvin Dietrich to E. I. du Pont de Nemours & Co.

Modifying petroleum acids with ammonia, etc. No. 2,373,938. Arthur Burwell to Alox Corporation.

Production of a saturated trihydric alcohol which comprises treating unsaturated monohydric alcohol, the unsaturation of which is due to olefinic linkage with hydrogen peroxide and water in presence of a tungstic acid. No. 2,373,942. Ingolfur Bergsteinsson to Shell Development Co.

Preventing foaming in process for separating unsaturated hydrocarbons from more saturated hydrocarbons in a mixture by vapor phase extraction with a selective solvent for said unsaturated hydrocarbons. No. 2,-373,951. Theodore Evans and Rupert Morris to Shell Development Co.

Effecting rearrangement of an aliphatic unsaturated primary monohydric alcohol containing at least four carbon atoms and an olefinic linkage between two carbon atoms. No. 2,373,956. George Hearne and Donald LaFrance to Shell Development Co.

Production of styrenes and other products from benzol still residues. No. 2,373,982. Murray Sturrock and Thomas Lawe to Dominion Tar & Chemical Co. Ltd.

Catalytic alkylation which comprises reacting branched chain paraffinic hydrocarbon with an olefinic hydrocarbon in presence of a catalyst consisting of aluminum chloride at 60° C.; whereby addition of activators to reaction mixture is avoided. No. 2,373,999. Philip Caesar and Alexander Sachanen to Socony-Vacuum Oil Co. Inc.

Manufacture of acrylonitrile from ethylene cyanohydrin. No. 2,374,051. LeRoy Spence to Rohm & Haas Co.

Producing acrylonitrile by catalytic dehydration of ethylene cyanohydrin. No. 2,374,052. LeRoy Spence and John Mitchell to Rohm & Haas Co.

Recovering liquefiable hydrocarbons from a distillate fluid obtained from a well tapping a distillate reservoir. No. 2,374,091. Allen Garrison to Texaco Development Corp.

Recovering desirable liquefiable constituents from distillate well gas initially at a pressure as high as retrograde condensation range of said constituents. No. 2,374,104. Chalmer Kirkbride to Pan American Refining Corp.

Catalytic reaction of isocyanates with organic compounds. No. 2,374,-136. Henry Rothrock to E. I. du Pont de Nemours & Co.

Aromatizing hydrocarbons by subjecting non-benzenoid hydrocarbon to action of a contact-mass consisting of oxides characterized by being a dried co-precipitate formed by addition of first ammonia gas and then ammonium hydroxide to solution of salts of aluminum and a metal. No. 2,374,175. Robert Burk and Everett Hughes to The Standard Oil Co.

Sulphonating organic compound selected from aliphatic hydrocarbons, alicyclic hydrocarbons and higher alkyl monocyclic aromatic hydrocarbons comprising reacting said organic compound with sulphuryl chloride in dark in presence of organic peroxide and organic nitrogen compound. No. 2,374,193. Henry Grubb and Elton Tucker to Standard Oil Co.

Preparing material having biotin-like activity which comprises extracting molasses fermentation residue with organic solvent selected from acetone, ethyl alcohol, methyl alcohol, ethyl acetate, and ethylene dichloride. No. 2,374,212. Joseph Karabinos and Elmer Eckhardt and Wilbur Patterson to S. M. A. Corporation.

Stabilization of fatty materials which comprises steam deodorizing nonvolatile fatty material in presence of gum guaiac. No. 2,374,234. Guy Phelps and Howard Black to Industrial Patents Corp.

Water-soluble, surface-active condensation product of a water-soluble aldoside with a polyhydric alcohol. No. 2,374,236. Paul Salzberg and James Werntz to E. I. du Pont de Nemours & Co.

Manufacture of vinyl chloride by simultaneous thermal decomposition of ethylene dichloride and chlor-substitution of ethylene. No. 2,374,-237. Herbert Stanley and James Youell to The Distillers Co. Ltd.

Dehydrating 1,3-butylene glycol to produce 1,3-butadiene. No. 2,374,-253. Clayton Wynn to Air Reduction Co., Inc.

Preparing dinitro-Bz-1:Bz-1'-dibenzanthronyls. No. 2,374,328. Clifford Carr to E. I. du Pont de Nemours & Co.

Reacting di-methylamino-isopropanol or 2-dimethylamino propanol with phosgene in chloroform, thereafter reacting with ammonia in chloroform, and treating reaction product with methyl iodide. No. 2,374,-367. Randolph Major and Howard Bonnett to Merck & Co., Inc.

Manufacture of reduction products from unsaturated fatty acids or their derivatives using mixed catalyst containing metallic vanadium and metallic zinc or metallic cadmium. No. 2,374,379. Wilhelm Rittmeister to American Hyalsol Corp.

Producing 1,3-butadiene by dehydration of 1,3-butylene glycol. No. 2,374,405. Frederick Balcar to Air Reduction Co., Inc.

Separating mixture containing two or more of the bases 3-picoline, 4-picoline, and 2,6-lutidine, which consists in converting bases into their hydrohalides, and separating hydrohalides by fractional distillation. No. 2,374,418. Francis Cislak and Orin Cunningham to Reilly Tar & Chemical Corp.

Producing butadiene which comprises subjecting ethyl alcohol to contact with catalyst consisting of magnesium oxide prepared by precipitating compound of magnesium decomposable into oxide from a solution of magnesium salt. No. 2,374,433. Vladimir Ipatieff to Universal Oil Products Co.

Treating heat labile fat-containing material to dry and defat same comprising dispersing material in a liquid water-immiscible fat solvent. No. 2,374,455. Jules Porsche and George Josh to Armour & Co.

Nitroglycol ester. No. 2,374,484. Henry Haas and Byron Vanderbilt to Purdue Research Foundation.

Dealkylation of unsymmetrical di-n-butyl urea which comprises dissolving said di-n-butyl urea and ammonia in a solvent comprising a lower aliphatic alcohol, etc. No. 2,374,485. Vernon Haury to Shell Development Co.

Halogenated ketals and process for preparing same. No. 2,374,494. Glen Morey to Commercial Solvents Corp.

Monomethyl amino phenol sulfamate. No. 2,374,501. Verne Reckmeyer and August Brunner, Jr. to General Aniline & Film Corp.

Isomerization of paraffinic hydrocarbons of at least 4 carbon atoms per

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

molecule by means of a catalyst comprising an aluminum halide. No. 2,374,507. Walter Schulze to Phillips Petroleum Co.

Morpholine substituted esters. No. 2,374,525. Lee Cheney and William Bywater to Parke, Davis & Co.

Production of ethylbenzene. No. 2,374,600. Vladimir Ipatieff and Louis Schmerling to Universal Oil Products Co.

Condensation products of hetero-monocyclic urea derivatives. No. 2,374,-647. William Burke and Fred Hoover to E. I. du Pont de Nemours & Co.

Condensation products of N,N'-bis (alkoxymethyl) urea and processes for their production. No. 2,374,648. William Burke and James Werntz to E. I. du Pont de Nemours & Co.

Regenerating spent inorganic catalyst by removal of accumulated carbonaceous material therefrom. No. 2,374,660. Arnold Belchetz and Henry Nelly, Jr. to The M. W. Kellogg Co.

Reaction of an amylaceous substance, which forms gelatinous dispersions when cooked in water, with an organic hydroxy compound. No. 2,374,-676. Herbert Gardner to Stein, Hall & Co. Inc.

Vegetable phosphatide containing oil dispersible organic sulfonic acid to increase glyceride oil solubility of phosphatide. No. 2,374,681. Percy Julian and Edwin Meyer to American Lecithin Co.

Difficultly emulsifiable lubricating composition for lubricating high pressure internal combustion engines without varnish formation, comprising mineral lubricating oil and phosphatide treated with acid material so that charges upon "zwitter" ions which tend to cause water solubility have been neutralized and phosphatidic material is near its isoelectric point. No. 2,374,682. Percy Julian and Edwin Meyer to American Lecithin Co.

Organic peroxide. No. 2,374,789. Franklin Strain to Pittsburgh Plate Glass Co.

Organic amine derivatives and method of obtaining same. No. 2,374,791. Edward Tillitson to Parke, Davis & Co.

Arylamino compounds. No. 2,374,807. Joseph Dickey and James McNally to Eastman Kodak Co.

Alkylation of isoparaffinic hydrocarbons in presence of a hydrogen fluoride catalyst wherein hydrocarbon reaction products are separated from bulk of used catalyst in a settling zone. No. 2,374,819. Elmer Kanhofer and Bernard Becker to Universal Oil Products Co.

Separating conversion products formed in dehydrogenation of ethylbenzene under subatmospheric pressure. No. 2,374,826. Harrison Mayland to Universal Oil Products Co.

Cyclic process for recovering carbon dioxide from gases which comprises producing a sludge containing solid potassium pentaborate octohydrate and a solution of potassium borates, bicarbonate and chloride, heating sludge to dissolve suspended solids and to react potassium pentaborate with potassium bicarbonate to evolve carbon dioxide gas, and contacting cold solution with gases to absorb carbon dioxide. No. 2,374,876. Frank May to American Potash & Chemical Corp.

Converting oleic amide into a substituted amino acid amide of a monocarboxylic acid. No. 2,374,915. Frederick Bersworth to The Martin Dennis Co.

Effecting substitution halogenation of an unsaturated aliphatic halide. No. 2,374,923. Oliver Cass to E. I. du Pont de Nemours & Co.

Catalytic dehydrogenation of low molecular weight hydrocarbons which comprises passing hydrocarbons between 1000 and 1600° F. over a catalyst comprising aluminum oxide, vanadium oxide and silver. No. 2,374,932. Walter Guyer to Standard Oil Development Co.

Alkylidene bis-salicylic acids and method of preparing same. No. 2,374,-949. Joseph Niederl.

Making modified olefin polysulphide products which comprises intermixing (1) water soluble inorganic polysulphide, (2) dihalogenated aliphatic hydrocarbon, (3) carbonylic compound selected from formaldehyde, acetaldehyde, anisaldehyde, etc., (4) organic derivative of ammonia selected from aniline, thiourea, and urea. No. 2,374,963. Francis Vass to Krebs & Co.

The diacetoneamine salt of a rosin acid. No. 2,374,969. Ludwig Audrieth to Hercules Powder Co.

Aliphatic sulphur compound having single thiol sulphur atom to which is directly attached a cation and a secondary carbon atom to which two aliphatic radicals forming open chain of 10 to 20 carbon atoms are also directly attached. No. 2,374,983. Martin deSimo and John O'Connor to Shell Development Co.

Preparing an alpha-beta unsaturated monocarboxylic acid nitrile. No. 2,375,005. Frederick Kung to The B. F. Goodrich Co.

Composition of reduced foaming properties comprising organic liquid having foaming tendencies and active defoaming compound selected from polymerized dihydrocarbon silicones and dihydrocarbon silicates. No. 2,375,007. Robert Larsen and Hyman Diamond to Shell Development Co.

Nitrile selected from acrylonitrile and alpha-substituted acrylonitriles in which substituent is a lower alkyl radical, and a stabilizing amount of an alpha-beta unsaturated amine is dissolved in said nitrile. No. 2,375,015. Kenneth Marple and Bert Borders to Shell Development Co.

Production of nitriles which comprises commingling allyl amine and oxygen with an inert diluent and conveying mixture in contact with silver metal catalyst. No. 2,375,016. Kenneth Marple and Theodore Evans and Bert Borders to Shell Development Co.

Dehydrogenating aliphatic hydrocarbons which comprises contacting under dehydrogenating conditions with oxide of from left-hand column of group 4 of periodic table, supported on activated alumina comprising a calcined aluminum hydrate of high adsorptive capacity. No. 2,375,021. Jacque Morrell to Universal Oil Products Co.

Concentration of a hydrocarbon mixture comprising structural isomers of a substituted pentadiene. No. 2,375,023. Rupert Morris and John Van Winkle to Shell Development Co.

Isomerization of a branched-chain poly-olefinic compound. No. 2,375,024. Rupert Morris and John Van Winkle to Shell Development Co.

Reducing tendency for phenolic solvents to react with diolefins when hydrocarbon mixture containing diolefins is distilled in presence of such a solvent, comprising distilling mixture in presence of solvent containing alkali metal phenolate to reduce said tendency. No. 2,-375,035. Gino Pierotti to Shell Development Co.

Extractive distillation of hydrocarbon mixtures containing diolefins with a phenolic solvent, comprising distilling mixture in presence of dissolved aliphatic amine. No. 2,375,036. Gino Pierotti and Clarence Dunn to Shell Development Co.

Producing alkylated aromatic hydrocarbons which comprises subjecting aromatic hydrocarbon and olefinic hydrocarbon to contact under alkylating conditions in presence of catalyst containing material formed by calcining cupric orthophosphate. No. 2,375,041. Louis Schmerling and Vladimir Ipatieff to Universal Oil Products Co.

Oxidizing to disulphide a thio acid salt selected from water soluble thiocarbonates and water soluble thiocarbamates, which comprises introducing oxidizing chlorine or bromine into atmosphere above surface of thio acid salt. No. 2,375,083. Robert Cooper to Monsanto Chemical Co.

Producing conjugated diolefins which comprises subjecting a high boiling diester of a glycol to pyrolysis. No. 2,375,086. Harold Davis to American Cyanamid Co.

Preparing more concentrated solution of amino acid compounds from impure dilute solution derived from processing of protein-containing organic matter, which comprises passing dilute solution through a bed of granular organic hydrogen exchange material. No. 2,375,165. Alpheus Nees and Arthur Bennett to The Great Western Sugar Co.

Manufacture of methoxymethylene-malonitrile. No. 2,375,185. Franz Bergel, Aaron Cohen and John Wynne Haworth to Roche Products Ltd.

Converting mixture of malt and cooked mash for subsequent fermentation purposes comprising: holding it at normal conversion temperature for less than 15 minutes, and then immediately cooling to normal alcoholic-yeast fermenting temperature range. No. 2,375,189. Harrison Blankmeyer and William Stark to Joseph E. Seagrams & Sons, Inc.

Antioxidant composition comprising ascorbyl monoester of a saturated aliphatic monocarboxylic acid and a compound selected from alpha-tocopherol and isomers and analogues of alpha-tocopherol. No. 2,375,250. Roy Riemenschneider and Jack Turer to Secretary of Agriculture of the United States of America.

Hydrosol of Irish moss and method of preparing the same. No. 2,375,-259. Gordon Webster Stoyle.

Recovering dry product from fermentation residue which comprises spraying fermentation residue into stream of inert gas. No. 2,375,288. Wolcott Dennis to U. S. Industrial Chemicals Inc.

Interface modifier containing phosphorus and sulfur-containing product obtained by reacting a phosphorus sulfide and an olefin, and neutralizing resulting reaction product. No. 2,375,315. Lawson Mixon to Standard Oil Co.

Reproduction material comprising base having photo-sensitive coating which includes diazonium compound. No. 2,375,366. David Jacobus and John Bose to Keuffel & Esser Co.

Extracting pectinous materials which comprises forming aqueous dispersion of material, adjusting to pH of 2 to 4, adding compound selected from alkali metaphosphates and alkali polyphosphates. No. 2,375,376. William Maclay and John Nielsen to the Secretary of Agriculture of the United States of America.

Reducing carbon-forming tendency of catalytic masses. No. 2,375,402. Ben Corson and Constantine Maxutov to Universal Oil Products Co.

Purification of solvent mixture consisting of up to 40% of a higher homologue of ethyl alcohol, methylene chloride and a chlorinated hydrocarbon, such solvent mixture used for casting clear photographic film base of cellulose acetate and other cellulose derivatives, being contaminated by water and acidic constituents, which comprises treating mixture with anhydrous potassium carbonate. No. 2,375,460. Charles Barbre to General Aniline & Film Corp.

Treatment of a complex normally liquid hydrocarbon fraction having boiling range of 200 to 240° F. to separate it into component parts of dissimilar characteristics which comprises distilling in presence of methyl ethyl ketone as an azeotrope former, etc. No. 2,375,478. George Lake to Union Oil Co. of California.

Forming unsaturated fatty alcohols which comprises subjecting to reaction with hydrogen at high temperature and pressure, in presence of a copper-containing catalyst, compound selected from fatty acids and fatty acid esters and cadmium soap. No. 2,375,495. Albert Richardson and James Taylor to The Procter and Gamble Co.

Certain water-soluble high molal oxyalkylated esters and method of making same. No. 2,375,529. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Hydroxyacetylated drastically-oxidized ricinoleic acid compound selected from blown castor oil, triricinolein, diricinolein, monoricinolein, superglycerinated castor oil, superglycerinated castor oil, ricinoleic acid, polyricinoleic acid, and castor oil estolides. No. 2,375,530. Melvin De Groote, Bernhard Keiser and Arthur Wirtel to Petrolite Corp. Ltd.

Hydroxyacetylated drastically-oxidized dehydrated ricinoleic acid compound selected from drastically-oxidized dehydrated castor oil, dehydrated triricinolein, dehydrated diricinolein, monoricinolein, dehydrated ricinoleic acid, dehydrated polyricinoleic acid, and the estolides of dehydrated castor oil. No. 2,375,531. Melvin DeGroote, Bernhard Keiser and Arthur Wirtel to Petrolite Corp. Ltd.

Water-soluble acylated derivative of a basic hydroxylated polyamine. No. 2,375,532. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Polycarboxy acid esters of hydroxylated acylated ureas. No. 2,375,533. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

New composition consisting of oxyalkylated resultant of acetalization reaction product of a member of ricinoleic acid, polyricinoleic acid and their esters, with a member of aldehydes and ketones. No. 2,375,540. Melvin DeGroote to Petrolite Corp. Ltd.

Separating and concentrating butadiene which comprises, passing hydrocarbon liquid that is gaseous at atmospheric temperatures in countercurrent flow with a cuprous salt solution. No. 2,375,576. Charles Morrell and Miller Swaney to Standard Oil Development Co.

Recovering and segregating naturally occurring phenols and naphthenic acids from petroleum oils which comprises contacting said oils with bauxite, etc. No. 2,375,596. Barney Strickland to Standard Oil Development Co.

Increasing melting point of a rosin which comprises contacting rosin with mixture of a sulfonic acid of an organic hydrocarbon and acetic acid. No. 2,375,618. Edward Bried to Hercules Powder Co.

Preparing derivatives of morpholine and thiamorpholine. No. 2,375,628. Gaetan o D'Alelio and James Pyle to General Electric Co.

Isomerization of terminally unsaturated non-tertiary olefins to beta-unsaturated olefins which comprises contacting said olefins with reduced cobalt. No. 2,375,687. Walter Peterson and John Anderson to Shell Development Co.

*Medicinals

Saturated and unsaturated 17-hydroxyandrostanes, their derivatives and substitution products and process of making same. No. 2,374,369. Karl Miescher and Albert Wettstein to Ciba Pharmaceutical Products, Inc.

Saturated and unsaturated 17-hydroxyandrostanes, their derivatives, substitution products and process of making same. No. 2,374,370. Karl Miescher and Albert Wettstein to Ciba Pharmaceutical Products, Inc.

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

Therapeutically active member of group consisting of diamidine derivatives. No. 2,375,740. Harry Barber to May & Baker Ltd.

*Metals, Alloys

Producing metal sponge which comprises maintaining a charge comprising divided metal oxide to be reduced in form of a bed within a reducing zone, etc. No. 2,373,657. David Burruss, Jr. and Joseph Drapeau. Jr. to The Glidden Co.

Hydraulic classification method for solids in liquids, which comprises maintaining a liquid-solids mixture enclosed on three sides and bottom to form a pool, etc. No. 2,373,662. Thomas Dickson to Colorado Iron Works.

Precipitation hardening an alloy containing beryllium, cobalt with remainder all aluminum. No. 2,373,678. Richards Harrington to General Electric Co.

Apparatus for production of magnesium oxide from magnesium hydroxide comprising an internally-fired inclined rotary kiln, etc. No. 2,373,749. Frank Elkington and Heinz Chesny.

Two-step process of preparing an alkali metal azide which comprises reacting alkali metal with anhydrous liquid ammonia and in second step maintaining ntirous oxide in intimate contact with foregoing reaction mixture. No. 2,373,800. Marshall Acken and William Filbert to E. I. du Pont de Nemours & Co.

Coating magnesium and magnesium alloys to resist corrosion. No. 2,373,937. Frank Allen and Jack Morgan to Magnesium Elektron Ltd.

Manufacture of alkali metal silicates. No. 2,374,035. Eugene Nutting, Jr. to Wyandotte Chemicals Corp.

Plate for offset printing comprising metallic plate which has been etched by mixture of ammonium phosphate, ammonium nitrate, ammonium fluoride, tartaric acid, ammonium bichromate, water, and glycerine. No. 2,374,070. Paul Barensfield to The American Steel & Wire Co. of New Jersey.

Low-flow-temperature silver solder comprising silver; copper; zinc; cadmium; tin and lead. No. 2,374,183. George Durst to Metals & Controls Corp.

Electrodepositing copper from bath which consists of copper sulfate, sulfuric acid, and which is saturated with dissolved cuprous cyanide. No. 2,374,289. Richard Hull to E. I. du Pont de Nemours & Co.

Coating finely divided material with aluminum in a sealed chamber. No. 2,374,331. Giles Cooke to Crown Cork & Seal Co. Inc.

Steel article having portion with higher carbon content than another portion, first-named portion being partially martensitic and second-named portion being predominantly bainitic. No. 2,374,351. John Hodge and Max Lightner.

Treating chromium-nickel stainless steel containing carbon and stronger-than-chromium carbide formers such as titanium, columbium, zirconium, etc., with its components that are ferrite formers proportioned to those that are austenite formers to cause production of stress-laden ferrite at low temperatures. No. 2,374,388. George Smith to United States Steel Corp. of Delaware.

Making austenitic stainless steel of chromium-nickel type with a sufficiently low carbon content to be inherently insensitive to intergranular corrosion. No. 2,374,396. Stephen Urban.

Producing from ferrous sulfate a pure, finely divided, precipitated, iron oxide for reduction and use in powder metallurgy. No. 2,374,454. Thomas Oliver, Ralph Long and Leo Crosson to Charlotte Chemical Laboratories, Inc.

Hardening of alloy steels, which comprises coating surface of steel with adhering mixture comprising oil and finely divided graphitic material, then heating to hardening temperature by electromagnetic induction in air, whereby resulting coating of graphitic particles formed on steel protects alloying metals in surface against oxidation during such heating. No. 2,374,634. Raymond Wile to Induction Heating Corp.

Production of sterilized and disinfectant substances which comprises treating reducible compound of oligodynamically active metal with a soluble metal formate selected from aluminum, thorium and zirconium fromates. No. 2,374,754. Ignaz Kreidl and Werner Kreidl to Synochem Corp.

Gold base brazing solder formed of 20 to 40% cadmium, 10 to 20% zinc and balance gold. No. 2,374,995. Franz Hensel to P. R. Mallory & Co., Inc.

In electrolytic production of metallic magnesium from fused magnesium chloride electrolyte, purifying magnesium chloride electrolyte prior to electrolysis. No. 2,375,009. Robert Lepsoe and Basil Hunt to The Mathieson Alkali Works, Inc.

Purifying metals of higher boiling point contaminated with alkali metal impurity of lower boiling point, which comprises heating metal to be purified in absence of air to distill alkali metal impurity but not metal to be purified, selectively oxidizing resulting alkali metal impurity vapor. No. 2,375,199. Peter Alexander to Metal Hydrides, Inc.

Printing master comprising plate of chromium-containing alloy steel provided on printing face thereof with electrolytic grain and having image forming substance superposed on predetermined zones of face. No. 2,375,210. Clements Batcheller.

Recovering a light metal from a fused bath more dense than the metal. No. 2,375,232. Robert McNitt.

Manufacturing chromium steels by preparing a bath of molten steel and adding chromium to the bath so prepared which comprises adding chromium as a comminuted solid alloy containing chromium, carbon, manganese and silicon, and iron. No. 2,375,291. Ernest Doom to Electro Metallurgical Co.

Extracting alumina of high purity from low grade alumina-bearing ore, including sintering ore with alkaline earth and alkali metal compounds to solubilize the alumina values and leaching sinter formed to produce leach liquor containing soluble alumina values. No. 2,375,342. Ralph Brown to Aluminum Co. of America.

Cyclic process of extracting silica-free alumina from bauxite. No. 2,375,343. Ralph Brown to Aluminum Co. of America.

Electrolytically brightening aluminum-silicon alloy surface, the alloy containing silicon, which comprises making surface an anode in an electrolyte consisting of HF, glycerine, and water. No. 2,375,394. Martin Tosterud to Aluminum Co. of America.

Electrical resistance wire of an alloy of platinum palladium and ruthenium. No. 2,375,446. Cecil Sivil to Baker & Co., Inc.

Producing bulky metallic preparations containing elemental metal which comprises heating liquid phase medium containing suspension of solid material comprising a bulky precipitate of a reducible metal compound, in presence of a reducing influence whereby medium is vaporized. No. 2,375,506. Joseph Turck, Jr. to Colgate-Palmolive-Peet Co.

Welding rod composed of a zinc-free magnesium base alloy containing aluminum, and manganese, and magnesium. No. 2,375,601. Ludwig Weber and George Sager to Aluminum Co. of America.

Producing design in color on a polished surface of a corrosion-resisting, alloy steel. No. 2,375,613. Clements Batcheller.

*Paints, Pigments

Preparing finely divided pigment which comprises suspending finely divided precipitated calcium carbonate in aqueous slurry with alkali metal hydroxide mixing therewith sufficient tall oil to coat pigment. No. 2,374,741. Frederick Gage and Paul Gegner to Pittsburgh Plate Glass Co.

Treating lead oxide which comprises forming a layer of lead oxide particles ⅛ inch in depth and oxidizing. No. 2,374,886. John Nordyke and Leonard Vaughn to The Eagle-Picher Lead Co.

Processing pigments of phthalocyanine type which comprises diluting sulfuric acid solution of crude pigment containing a hygroscopic sulfonated alkylated monocyclic aromatic hydrocarbon, etc. No. 2,375,120. Serge Loukomsky and Harold Lacey to American Cyanamid Co.

*Paper and Pulp

Manufacturing thin asbestos paper of not to exceed .005 inch thickness including asbestos fibers and a binder containing reaction product of lime and diatomaceous earth. No. 2,373,914. Robert Quinn to Johns-Manville Corp.

Conducting paper comprising fibrous body containing mixture of finely divided metal particles and a solid, fusible compound of monohydric alcohols, simple polyhydric alcohols, and sugars. No. 2,374,214. Bernard Kline and Curt Mobius to The Western Union Telegraph Co.

*Petroleum

Sweetening sour hydrocarbon oil. No. 2,373,645. Elmer Bender to Phillips Petroleum Co.

Production of cyclohexane from naphthenic petroleum distillates of nature of gasoline. No. 2,373,673. Donald Fuller and Bernard Greensfelder to Shell Development Co.

Production of high octane paraffinic blending stocks for aviation gasoline from saturated naphthenic petroleum fractions of gasoline constituents containing non-hydroaromatic naphthenes and paraffins. No. 2,373,674. Chester Crawford and Donald Fuller and Bernard Greensfelder to Shell Development Co.

Froth flotation process comprising agitating and aerating aqueous suspension of a non-metallic mineral ore in presence of flotation agents consisting of oil-soluble, water-dispersible and water-insoluble mahogany sulfonates and petroleum sulfonic acids to coat and float a portion of said ore. No. 2,373,688. Walter Keck to Sherwood Refining Co., Inc.

Catalytically polymerizing hydrocarbon fraction obtained from light oil produced during pyrolytic decomposition of petroleum oil from manufacture of combustible gas and free from oxygen-containing compounds. No. 2,373,725. Alger Ward to The United Gas Improvement Co.

Steam cylinder oil comprising a hydrocarbon lubricating oil having Saybolt Universal viscosity at 210° F. within 100 to 300 seconds, fatty oil, petroleum residuum obtained from naphthenic type crude petroleum oil, and complex glyceride phosphoric acid ester. No. 2,373,733. Elmer Adams and Frederick MacLaren to Standard Oil Co.

Contacting dimethyl pentane whose methyl groups are attached to separate carbon atoms, with a catalyst selected from sulphuric acid, halosulphonic acid and hydrogen fluoride to convert said dimethyl pentane into a dimethyl pentane whose methyl groups are attached to a different pair of carbon atoms. No. 2,373,740. Stanley Birch and Donald Besly to Anglo-Iranian Oil Co. Ltd.

Specific gravity indicator for drilling mud. No. 2,373,795. John Warren, Jr.

Recovering aluminum bromide from tarry masses formed in hydrocarbon conversion processes which employ aluminum bromide as catalystic agent. No. 2,373,803. Thomas Baker and Julian Friedman to Socony-Vacuum Oil Co., Inc.

In catalytic conversion of high boiling hydrocarbons to low boiling hydrocarbons within gasoline boiling range wherein catalyst is contacted in finely divided or powdered condition with vapors of hydrocarbons undergoing treatment, the improved method of recovering finely divided catalyst from vaporous conversion products. No. 2,374,073. Arnold Belchetz to The M. W. Kellogg Co.

Production of high quality motor fuel. No. 2,374,095. Carl Helmers to Phillips Petroleum Co.

Combination cracking process comprising solvent extracting fresh feed to produce fraction rich in mononuclear and poorer in polynuclear aromatics than said fresh feed, and fraction richer in paraffins and naphthenes than said fresh feed, etc. No. 2,374,102. Francis Jahn and Alex Oblad to Standard Oil Co.

Reforming hydrocarbons of naphtha boiling range to produce aromatic motor fuel of high octane number. No. 2,374,109. Edwin Layng and Donald Payne, one-half to Standard Oil Co., and one-half to The M. W. Kellogg Co.

Stabilizing a composition comprising paraffin wax, comprising incorporating in composition an oxidation inhibitor derived from a crude petrolatum. No. 2,374,127. Howard Peterson and Frederick MacLaren to Standard Oil Co.

Catalytic conversion of hydrocarbons in which catalyst is deactivated by deposition of carbon thereon and in which a moving catalyst bed flows through successive conversion and regeneration zones. No. 2,374,151. I. Louis Wolk and John Upham to Phillips Petroleum Co.

Cracking hydrocarbons in presence of sensitizer selected from non-metal-containing oxyhalogenated aliphatic hydrocarbons. No. 2,374,167. Richmond Bell, Hillis Folkins and Carlisle Thacker to The Pure Oil Co.

Geochemical prospecting system. No. 2,374,227. Herbert Metcalf to Consolidated Engineering Corp.

Production of high octane number fuels which comprises contacting an isoparaffin with an olefin in prsence of sulfuric acid. No. 2,374,262. John Anderson to Standard Oil Co.

Converting hydrocarbon oils to gasoline hydrocarbons of high anti-knock value which comprises contacting said oils with solid catalyst comprising a dried amorphous combination of hydrated silica gel, hydrated alumina gel, and a naturally-occurring, catalytically inactive montmoril-

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

lonite clay. No. 2,374,313. Preston Veltman to The Texas Co.

Conversion of hydrocarbons. No. 2,374,338. George Dunham to Socony-Vacuum Oil Co., Inc.

Subjecting hydrocarbons to dehydrogenating conditions in presence of a dehydrogenating catalyst comprising alumina and chromia and zirconium oxide. No. 2,374,404. Jacob Ahlberg to Universal Oil Products Co.

Separating a hydrogen halide from an olefinic hydrocarbon. No. 2,374,476. Theodore Evans and Harry Finch and George Hearne to Shell Development Co.

Conversion of hydrocarbons in presence of a moving corrosive catalyst which comprises subjecting hydrocarbons to conversion conditions in presence of moving catalyst within reaction zone bounded by corrodible permeable walls, and passing into reaction zone through permeable walls a non-corrosive fluid which forms a protective fluid barrier between walls and catalyst. No. 2,374,511. John Upham to Phillips Petroleum Co.

Catalytic process. No. 2,374,518. I. Louis Wolk and Thomas Whaley to Phillips Petroleum Co.

Lubricating composition comprising mineral lubricating oil having incorporated oil-soluble metal derivative of an alkyl substituted aryloxy sulfide and sulfurized hydrocarbon possessing anti-corrosive properties. No. 2,374,559. John Morris and Rush McCleary to The Texas Co.

Isomerizing butane by means of aluminum chloride catalyst, using a free halogen as a promoter, which comprises mixing the free halogen with sulfuric acid, etc. No. 2,374,933. Clarke Harding to Standard Oil Development Co.

Producing more valuable products from a hydrocarbon gas containing propene, butenes and butanes. No. 2,374,996. Eugene Herthel to Sinclair Refining Co.

Anti-knock motor fuel comprising gasoline fuel containing stable complex. No. 2,375,236. Pharis Miller to Standard Oil Development Co.

Isomerizing paraffinic hydrocarbon feed of naphtha boiling range which process comprises contacting portion of hydrocarbon feed with fresh liquid aluminum chloride-hydrocarbon complex isomerization catalyst in presence of hydrogen chloride promoter. No. 2,375,321. Cecil Nysewander and Nathan Fragen to Standard Oil Co.

Production of purified aromatic hydrocarbons from petroleum. No. 2,375,464. Edmund Borden to Cities Service Oil Co.

Lubricating oil and saturated alcohol-alpha beta unsaturated polybasic carboxylic acid-unsaturated aliphatic alcohol condensation polymer. No. 2,375,516. Charles Blair, Jr. to Petrolite Corp. Ltd.

Resolving petroleum emulsions of water-in-oil type, characterized by subjecting emulsion to action of a demulsifier, comprising a sub-resinous esterification product. No. 2,375,534. Melvin DeGroote to Petrolite Corp. Ltd.

Process for breaking petroleum emulsions. No. 2,375,535. Melvin DeGroote to Petrolite Corp. Ltd.

Breaking petroleum emulsions of water-in-oil type, which consists in subjecting emulsion to action of a demulsifier comprising an acylated and oxyalkylated derivative of 5-amino-1,3-dioxanes. No. 2,375,536. Melvin DeGroote to Petrolite Corp. Ltd.

Breaking petroleum emulsions of water-in-oil type, which consists in subjecting emulsion to demulsifier comprising oxyalkylated resultant of acetalization reaction product of a member of ricinoleic acid, polyricinoleic acid and their esters, with a member of aldehydes and ketones. No. 2,375,537. Melvin DeGroote to Petrolite Corp. Ltd.

Breaking petroleum emulsions of water-in-oil type, which consists in subjecting to demulsifier comprising an oxyalkylated, oxidized resultant of acetalization reaction product of a member of ricinoleic acid, polyricinoleic acid and their esters, with a member of aldehydes and ketones. No. 2,375,538. Melvin DeGroote to Petrolite Corp. Ltd.

Process for breaking petroleum emulsions. No. 2,375,539. Melvin DeGroote to Petrolite Corp. Ltd.

Treatment of hydrocarbon gases by hydration. No. 2,375,559. Arthur Hutchinson and Ira Bechtold to The Fluor Corporation, Ltd.

Treating normally gaseous mixture containing hydrate-forming hydrocarbon components and undesired hydrate-forming, non-hydrocarbon impurity to be removed, that includes converting said components to their solid hydrates, treating resulting hydrate mixture with a reagent, reactive with impurity, separating reaction product. No. 2,375,560. Arthur Hutchinson and Ira Bechtold to The Fluor Corporation, Ltd.

Treating hydrocarbon distillate boiling in range of 280° to 350° F. and containing appreciable quantities of naphthenes. No. 2,375,573. Herbert Meier to Standard Oil Development Co.

Controlling viscosity of aqueous drilling muds which comprises incorporating therein a water-soluble organic compound. No. 2,375,616. Robert Booth to American Cyanamid Co.

Treating hydrocarbon material containing normally liquid hydrocarbons and objectionable constituents of sulfur compounds and color- and gum-forming compounds. No. 2,375,675. Maryan Matuszak to Phillips Petroleum Co.

Refining hydrocarbon oil for purpose of removing metal ions which comprises contacting said oil with acid reacting carbonaceous ion exchange material prepared by coking acid sludge followed by treatment with concentrated acid. No. 2,375,694. Henry Schutze to Standard Oil Development Co.

Catalytic conversion of hydrocarbon oil into a hydrocarbon product of lower molecular weight which comprises contacting hydrocarbon oil with solid supported boric oxide catalyst and regenerating said boric oxide catalyst by burning after 7 minutes of contact under conversion conditions with said oil. No. 2,375,725. William Bailey, Jr. and Bernard Greensfelder to Shell Development Co.

*Photographic Chemical

Photographic silver halide emulsion spectrally sensitized with a sensitizing dye selected from cyanine and merocyanine dyes, said emulsion containing, as supersensitizer, an aromatic ketone. No. 2,373,659. Burt Carroll and John Spence to Eastman Kodak Co.

Photo-sensitive element, adapted to produce upon exposure and development a photographic positive for use in simultaneously etching pictorial and type matter on an intaglio printing surface. No. 2,373,732. Kurt Wolfson.

Producing color photographic images by color forming development, which comprises developing exposed silver halide emulsion with aromatic primary amino developer in presence of a water-soluble salt of a phenol described in patent. No. 2,373,821. Alfred Frohlich and Wilhelm Schneider to General Aniline & Film Corp.

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

Photographic multicolor images. No. 2,374,505. Wilhelm Schneider to General Aniline & Film Corp.

Photographic developer adapted to produce rapid development of photographic image with production of very small agglomerates or aggregates of the light-struck photo-sensitive material, while preserving detail and a desired scale of contrast. No. 2,374,921. Albert Bunting to E. J. Gray and Arthur Smith, trustees.

Photographic material for production of color-photographic images, comprising a support and light-sensitive silver halide gelatine emulsion layer containing a cyanoacetylhydrazone. No. 2,375,344. Pierre Bruylants and Philibert Merckx.

*Resins, Plastics

Obviating cracking tendency at temperatures below freezing and reducing brittleness in a shaped article of a rubber-like plasticizer conjoint polymer of vinyl chloride and vinyl acetate, which comprises immersing said article in liquid petrolatum. No. 2,373,699. Addeline McGillicuddy, one-half to G. A. Kjosness and one-fifth to Bennett Levenson.

Drying oil varnish having incorporated the resin resulting from catalytic polymerization by means of readily hydrolyzable metallic halide catalyst of a hydrocarbon fraction obtained from light oil produced during the pyrolytic decomposition of petroleum oil. No. 2,373,866. Alger Ward to The United Gas Improvement Co.

Malamine manufacturing process which comprises heating in autoclave a solution of cyanamide and dicyandiamide in a liquid anhydrous ammonia to form melamine, etc., the method of avoiding excessive corrosion of autoclave due to presence of carbonate radical in solvent which consists in adding to solvent an alkali which combines with carbon dioxide. No. 2,373,869. Andrews Wintringham to American Cyanamid Co.

Moldable wallboard composition, devoid of acid and alkali and which is heat resistant, incombustible and a non-conductor of electricity, said composition consisting in mixture of urea-formaldehyde, element selected from fuller's earth, flake mica and feldspar, crude cotton fiber and sufficient water. No. 2,373,945. George Bruns.

Producing highly stiffened fibrous materials, which comprises impregnating flexible, fibrous material with a solution in volatile solvent of a polyvinyl acetate, and subjecting polyvinyl acetate before impregnation to action of hardening substances selected from tannic acid and formaldehyde. No. 2,373,954. Paul Frankfurther.

Electrical insulating composition comprising polymerized rosin and gum accroides. No. 2,373,996. Joseph Borglin to Hercules Powder Co.

Composition comprising a polyvinyl acetal resin containing less than 25% free hydroxyl groups. No. 2,374,067. Witty Alderson, Jr. to E. I. du Pont de Nemours & Co.

Preparing plasticized linear polyamides which comprises delivering to mixing chamber a stream of molten polyamide having intrinsic viscosity of 1.0 and a stream of plasticizing agent. No. 2,374,069. Joseph Balthis to E. I. du Pont de Nemours & Co.

Polymeric material which is soluble in dilute hydrochloric acid, which yields hard films, and which is product obtained by heating to reaction temperature an N,N'-bis (alkoxymethyl) urea and an alkylolamine. No. 2,374,077. William Burke to E. I. du Pont de Nemours & Co.

Copolymer of divinyl formal and vinyl acetate. No. 2,374,078. Donald Coffman to E. I. du Pont de Nemours & Co.

Polymer of composition consisting of ester of a saturated aliphatic monocarboxylic acid and of an allyl alcohol. No. 2,374,081. Russell Dean to American Cyanamid Co.

Obtaining improved polyamide composition from a mixture of a plurality of different preformed synthetic linear polyamides which on hydrolysis with hydrochloric acid yield substances of class consisting of (a) monoaminomonocarboxylic acid hydrochlorides and (b) mixtures of diamine dihydrochloride and dibasic carboxylic acid. No. 2,374,137. Leroy Salisbury to E. I. du Pont de Nemours & Co.

Synthetic linear polyamide having improved resistance to degradation and comprising reaction product of a polyamide-forming composition and aromatic compound which is stable at polyamide-forming temperatures in presence of water. No. 2,374,145. Guy Taylor to E. I. du Pont de Nemours & Co.

Resin oil constituting oily distillate derived by destructive distillation of a pine wood resin containing about 85% of gasoline-insoluble resinous material. No. 2,374,220. Donald Lister to Hercules Powder Co.

Polymerization of piperylene-olefin mixtures and products obtained therefrom. No. 2,374,242. Frank Soday to The United Gas Improvement Co.

Triazine condensation products and process of making same. No. 2,374,259. Otto Albrecht, Charles Graenacher, and Richard Sallmann to Society of Chemical Industry in Basle.

Polymerizing isobutylene in liquid state with a boron fluoride catalyst at low temperatures. No. 2,374,272. Morris Carpenter and Charles Feuchter to Standard Oil Co.

Oil soluble resins characterized by thermoplasticity and oil-solubility comprising monomeric styrene reacted with inherently oil-soluble phenol-aldehyde resin. No. 2,374,316. Leo Whiting to Bakelite Corp.

Metallic soap-resin solutions. No. 2,374,446. Ralph Madison to Truscon Laboratories, Inc.

Linear polyamide and a phenol containing hyodroxylphenyl nuclei. No. 2,374,657. Joseph Bain to Nelio Resin Processing Corp.

Resinous reaction product of hydroxyacetic acid, polyhydric alcohol, polybasic carboxylic acid and a substance selected from linseed oil and linseed oil acids. No. 2,374,598. Hugh Gray to E. I. du Pont de Nemours & Co.

Resinous product characterized by anhydrophosphimic acid anil groups having double bond linkages between phosphorus atoms and nitrogen atoms directly attached to aryl groups. No. 2,374,646. Cedric Brown to Imperial Chemical Industries Ltd.

Resinous material and process of preparing, which comprises directly effecting condensation of formaldehyde and an abietic acid molecule and esterifying alcohol so formed with volatile carboxylic acid and then heating ester to distill off combined volatile carboxylic acid. No. 2,374,657. Joseph Bain to Nelio Resin Processing Corp.

Plasticizer for protein substance selected from casein and soybean protein, said plasticizer consisting of glycerol, formamide, and substance selected from diethanol amino triethanol amine, glycerol monoglycolate, etc. No. 2,374,667. Charles Dangelmajer.

Producing material for golf ball covers, comprising oxidizing soy bean oil until elastic gelled mass is obtained, and then mixing with a rubbery gum so that a hard, tough, moldable material is obtained. No. 2,374,692. Ellis Miller.

From Official Gazette—Vol. 574, Nos. 3, 4, 5—Vol. 575, No. 1 (May 15-June 5)—p. 590

Sheet wrapping material comprising rubber hydrochloride plasticized with dibutyl sebacate. No. 2,374,759. Theodore Latour to E. I. du Pont de Nemours & Co.

Producing modified urea aldehyde resin. No. 2,374,811. Samuel Gutkin to Falk & Co.

Producing modified urea aldehyde resin. No. 2,374,812. Samuel Gutkin to Falk & Co.

Producing modified phenol aldehyde resin. No. 2,374,813. Samuel Gutkin to Falk & Co.

Producing modified phenol aldehyde resin. No. 2,374,814. Samuel Gutkin to Falk & Co.

Copolymers of acrylic nitriles with lesser amounts of conjugated dienes. No. 2,374,841. Waldo Semon to The B. F. Goodrich Co.

Recovery of boron fluoride from polymerization mixtures of boron fluoride and material selected from rosins and rosin esters. No. 2,374,957. Alfred Rummelsburg to Hercules Powder Co.

Recovery of boron fluoride from a water-insoluble polymerization reaction mixture dissolved in inert water-immiscible organic solvent and containing boron fluoride. No. 2,374,958. Alfred Rummelsburg to Hercules Powder Co.

Low-density, free-flowing particulate material of high compressive strength comprising cellular carbonaceous particles selected from cork, balso, bagasse, bongo wood and corncobs, supported by synthetic heat-hardened resin to form a rigid structure. No. 2,375,008. Robert Lawrence to Hercules Powder Co.

Polymer of a monomeric material consisting of a polymerizable butadiene-1,3 and, a salt of unsubstituted dithiocarbamic acid. No. 2,375,042. Waldo Semon to The B. F. Goodrich Co.

Protein plastic composition comprising a prolamine which has been treated with a hardening agent in presence of a compound. No. 2,375,103. Stuart Harrison to The B. F. Goodrich Co.

Making thermoplastic composition containing rubber and wax which comprises dispersing a plasticized rubber mass containing polyvalent metal soap in a non-aqueous medium comprising a wax. No. 2,375,162. Joseph Zemaitis to Dispersions Process, Inc.

Making adhesive composition containing rubber and cumaron resin which comprises dispersing plasticized rubber mass containing polyvalent metal in a nonaqueous medium comprising cumaron resin. No. 2,375,163. Joseph Zemaitis to Dispersions Process, Inc.

Thermosetting adhesive in aqueous suspension containing finely divided amorphous gel-like particles of reaction product of blood albumen and a phenol and alkali to impart to a pH of 7 to 10. No. 2,375,195. Ogden Carmichael to I. F. Laucks, Inc.

Forming a spiral spring having a plurality of turns from thermoplastic material. No. 2,375,357. Theodore Friedman.

Fabricating resinous body of great compressive strength that comprises impregnating cellulosic fabric with solution of formaldehyde-urea reaction product in solvent selected from water and alcohols, and acidifying agent for hardening reaction product. No. 2,375,365. Arthur Howald and Leonard Meyer to Libbey-Owens-Ford Glass Co.

Treating plastic sheeting used in manufacture of laminated safety glass, and that is formed of a polyvinyl acetal resin plasticized with dibutyl sebacate, to facilitate handling, comprising applying temporary coating of powdered sugar to plastic sheeting. No. 2,375,396. George Watkins to Libbey-Owens-Ford Glass Co.

Process of impregnating webs with thermoplastic saturant. No. 2,375,403. Michele Croce to Certain-Teed Products Corp.

New plastic composition obtained by heating until evolution of HCl has ceased a rubber-like co-polymer of butadiene and acrylic nitrile with crude tolyl dichlor phosphine. No. 2,375,572. George Martin to Monsanto Chemical Co.

Making screen fabric composed of monofils of thermoplastic material. No. 2,375,597. Harry Thomas.

Printing with thermoplastic inks which are solid at normal room temperatures and become liquid when heated to elevated temperatures. No. 2,375,660. Wilbur Jones to Interchemical Corp.

Plastic composition comprising ethyl cellulose and a mono-ether of hydroquinone as a stabilizer therefor. No. 2,375,708. John Tinsley to Hercules Powder Co.

Manufacture of melamine which includes heating member of group consisting of cyanamide, dicyandiamide and mixtures thereof in liquid ammonia. No. 2,375,731. William Caldwell, Robert Swain and Joseph Paden to American Cyanamid Co.

*Rubber

Preparing filler composition comprising rubber and a cellulose filler from guayule plants, said composition being adapted for compounding with rubber and rubber-like materials. No. 2,373,689. Paul Kenda.

Polymerizing monomeric material containing conjugated butadiene in an aqueous emulsion containing two alkali metal salts of fatty acids. No. 2,373,753. Charles Fryling to The B. F. Goodrich Co.

Stabilized butadiene-1,3 composition consisting of monomeric butadiene-1,3 and aliphatic mercaptan, said stabilized butadiene-1,3 being stable against polymerization under storage conditions but being readily polymerizable in aqueous emulsion. No. 2,373,754. Charles Fryling and Waldo Semon to The B. F. Goodrich Co.

Preserving a rubber which comprises treating a rubber with condensation product of an aliphatic ketone and a primary amine. No. 2,374,098. Joseph Ingram to Monsanto Chemical Co.

Devulcanizing scrap rubber which comprises comminuting said rubber and subjecting it to action of a hot caustic alkali solution, and a devulcanization accelerator consisting of a synthetic hydrocarbon fraction. No. 2,374,101. Robert Jaeger to Standard Oil Co.

Vulcanizing a copolymer of a conjugated diene hydrocarbon and an alpha-methylene nitrile in presence of vulcanizing agent comprising a bis (oxythiono) polysulfide. No. 2,374,385. Doran Sauser to The B. F. Goodrich Co.

Abrasion-resistant synthetic rubber consisting of a conjugated diolefine, a 2-(delta 1)-alkenyl-aromatic compound having not more than 4 carbon atoms in alkenyl radical and an unsaturated ketone. No. 2,374,589. Robert Dreisbach to The Dow Chemical Co.

Vulcanized butadiene-styrene copolymer synthetic rubber compound comprising 10%-20% by weight on rubber of an aldolnaphthylamine. No. 2,374,843. Albert Somerville to R. T. Vanderbilt Co. Inc.

Bonding rubber to plies of fabric containing cotton which comprises applying to fabric a coating from an aqueous dispersion of rubber containing a quaternary ammonium compound. No. 2,375,089. Earle Ebers to United States Rubber Co.

Polymerizing a butadiene-1,3 hydrocarbon in aqueous emulsion containing as emulsifying agent water soluble salt of aliphatic-substituted benzene sulfonic acid. No. 2,375,140. Waldo Semon to The B. F. Goodrich Co.

Treating rubber which comprises vulcanizing it in presence of an N,N-dihydrocarbon substituted amino phenyl methylene naphthol. No. 2,375,168. Albert Hardman to Wingfoot Corp.

Manufacture of rubberized fibers and sheets. No. 2,375,245. Paul Pretzel.

Manufacture of rubber treated fiber. No. 2,375,414. Clark Heritage to Wood Conversion Co.

*Textiles

Viscose process in which non-miscible opacifying agent is dispersed in viscose prepared from cellulosic material having not more than 0.15% of naturally occurring ether extractable matter. No. 2,373,712. Paul Schlosser and Kenneth Gray to Rayonier Inc.

Fiber working unit for textile machines provided with surface layer having base of a highly elastic synthetic rubber of polymerized halogenated acetylene type. No. 2,373,876. Roger Wilson Cutler.

Rayon bleaching and scouring treatment which comprises simultaneously scouring and bleaching the rayon by subjecting it to alkaline aqueous solution having dissolved therein hydrogen peroxide and a synthetic organic water-soluble detergent salt. No. 2,373,881. Archie Dubeau and James MacMahon and George Vincent to The Mathieson Alkali Works, Inc.

Producing filaments of true I-beam cross-section having high degree of resiliency and crush resistance and adapted for pile fabrics which comprises extruding filament-forming solution composed of a cellulose organic acid ester dissolved in volatile solvent in form of filaments through spinneret having rectangular extrusion orifices. No. 2,373,892. Robert Hickey to Eastman Kodak Co.

Imparting to wool a gloss resembling that of natural silk which comprises treating wool with a non-aqueous agent selected from chlorine gas, sulphuryl chloride, organic hypochlorites and nitrosyl chloride to diminish tendency of wool to felt, and subjecting wool so treated to solution of papain containing an electrolyte. No. 2,373,974. Henry Phillips, William Middlebrook and Alfred Higgins to Wool Industries Research Association.

Material for imparting reserve buoyancy to water-borne craft, comprising assembly of closed cylinders full of air, said cylinders being formed of textile fabric having a coating of artificial organic water resistant polymer which stiffens fabric and renders it impervious to water. No. 2,374,372. William Moss to British Celanese Ltd.

Textile printing emulsions and method of preparing them comprising pigmented heterogeneous dispersion of water insoluble, organic solvent soluble heat convertible synthetic resin in a volatile, non-aromatic hydrocarbon vehicle, said dispersion being capable of emulsification to form a uniform water-in-oil emulsion. No. 2,374,602. Roy Kienle and Alfred Peiker to American Cyanamid Co.

Solution for production of artificial textile materials, films and other shaped articles, comprising a polymerized mixture of vinyl chloride and vinyl acetate in mixture consisting of acetone and ethylene methylene ether. No. 2,374,780. Robert Roberts and Edgar Johnson and Michael Young to Celanese Corp. of America.

Increasing affinity of cellulosic textile material for those dyestuffs used for dyeing wool and like animal fibers, and imparting silky handle by treating before dyeing with aqueous solution containing formaldehyde and an arylguanidine and then converting mixture into insoluble condensate, by drying and heating in presence of an acid catalyst. No. 2,375,124. James MacGregor to Courtaulds Ltd.

Textile printing paste comprising emulsion, inner phase of which is an aqueous alkaline solution of a diazo coupling component, and outer phase of which is microscopic dispersion of a piperazine-bis-diazomino compound. No. 2,375,132. Roy Pizzarello to Interchemical Corp.

*Water Sewage and Sanitation

Production of fresh water from salt water which comprises treating salt water with lead fluoride and with trivalent metallic flouride selected from ferric fluoride and aluminum fluoride. No. 2,373,884. Hans Rudolph Frisch.

Softening water containing alkaline-earth metal compound, which comprises adding thereto crystalline alkali-metal tripolyphosphate. No. 2,374,100. Henry Jackson to Hall Laboratories, Inc.

Apparatus for aerating sewage. No. 2,374,772. Carl Nordell.

Destroying organisms in water intended for potable use comprising subjecting water to pressure of 1000 pounds per square inch raising temperature of water, etc. No. 2,374,805. James Camelford to Buckeye Laboratories Corp.

Agricultural Chemicals

Preparing soil for pineapple culture which comprises adding thereto between 50 and 300 pounds per acre foot, a solution of bromine dissolved in solvent selected from carbon tetrachloride and tetrachlorethane. No. 2,377,446. John Payne to The Pacific Guano and Fertilizer Co.

Conditioning soil infected with nematodes which comprises incorporating in soil a water-soluble salt of sulfamic acid to devitalize the nematodes. No. 2,377,626. Hubert Guy to E. I. du Pont de Nemours & Co.

Stabilized soil having dispersed therein alkali soap of petroleum-hydrocarbon insoluble pine wood resin, said soap containing saponified resin. No. 2,377,639. Abraham Miller, deceased, by Hazel Miller, administratrix, to Hercules Powder Co.

Cellulose

Cellulosic derivative selected from cellulosic ethers and cellulosic esters and a plasticizer containing a diester. No. 2,376,396. Frank Soday to The United Gas Improvement Co.

Production of mixed esters of cellulose. No. 2,376,422. Henry Dreyfus.

Ceramics

Treating glass article whose opposite surfaces have unequal rates of heat abstraction per unit of projected area. No. 2,376,872. Samuel Harris

* *Continued from Vol. 573, Nos. 3, 4; Vol. 574, Nos. 1, 2.*

to Holophane Co. Inc.

Fortifying surfaces of glass consisting of silica and base metal oxides, which comprises exposing glass to an atmosphere near point of saturation in water, etc. No. 2,377,062. Frederick Adams to Pittsburgh Plate Glass Co.

Forming cellular glass by heating mixture of pulverulent glass and a thermally decomposable gassing agent, preliminarily coating mold with film of chemically hydrated bauxite as a parting agent. No. 2,377,076. Walter Ford to Pittsburgh Corning Corp.

Laminated glass structure comprising two sheets of glass and interposed layer of thermoplastic adherent to glass sheets, area of thermoplastic layer being enough so that it extends beyond glass sheets to provide flexible attaching flange. No. 2,377,084. Leroy Keslar to Pittsburgh Plate Glass Co.

Vitreous-like, dense, non-porous, hard ceramic article containing 80% to 99% Al_2O_3, 0.6% to 12% SiO_2 and 0.4% to 8% MgO. No. 22,648. John Heany to Heany Industrial Ceramic Corp.

Polymeric organo-silicon oxide having one organic radical per silicon atom, former being selected from alkyl radicals of 1 to 3 carbon atoms and phenyl radicals, and boric oxide. No. 2,375,998. Bob McGregor and Earl Warrick to Corning Glass Works.

Chemical Specialties

For preventing sunburn of human skin but permitting passage of beneficial and tanning rays **to skin**, comprising hydroquinone-containing preparation containing vehicle having incorporated member of laevo-ascorbic acid and its salts. No. 2,376,884. Erwin Schwenk and Edward Henderson to Schering Corp.

Derivatives of sulphonated amines and process of preparing same to form stable capillary active solutions of good washing power. No. 2,376,911. Charles Graenacher and Paul Streuli and Jules Meyer to Swiss Co. of Society of Chemical Industry in Basle.

Polishing composition containing wax and reaction product of alkali and a paste composed of ground, roasted coffee beans and a fatty material. No. 2,376,956. Robert Brown.

Stabilized pulverulent cleansing composition comprising soap; an alkali salt selected from sodium carbonate, sodium bicarbonate, borax, sodium silicate, and tri-sodium phosphate; an oxidizing agent selected from sodium perborate and sodium percarbonate; and stabilizing agent. No. 2,377,066. William Baird, Arthur Hill, John Harris, Stephen Oakeshott and Wilfrid Wilson to Imperial Chemical Industries Ltd.

Determining if wax in a wax-containing material is of petroleum origin which comprises extracting material with solvent for wax, slowly evaporating solvent to promote growth of orthorhombic crystals. No. 2,377,082. Bela Hubbard to Standard Oil Development Co.

Normally solid lubricant comprising foots oil and petrolatum, and fats and higher fatty acids. No. 2,377,106. Maurice Reswick to Standard Oil Development Co.

Pest-control composition containing toxic amount of dilauryl sulphite and carrier therefor. No. 2,377,148. Ingenuin Hechenbleikner to American Cyanamid Co.

Sun ray filtering preparation for preventing sunburn of human skin while permitting beneficial and tanning rays to pass through to skin, comprising emulsified vehicle containing air-sensitive filtering agent of hydroquinone, menthyl salicylate, umbelliferone acetic acid salts or 2,6-dichloro-pyridine-4 carboxylic acid and its esters and salts, and oxidation inhibitor in form of a reducing compound of laevo and dextro ascorbic acids, arabo-ascorbic acid, glucono-ascorbic acid, etc. No. 2,377,188. Erwin Schwenk and Edward Henderson to Shering Corp.

As fluorescent factor in artificial teeth, a metallic salt of quinine, group in proportion of four to forty-eight grains of salts to between one and three pounds of tooth material. No. 2,377,382. Fred Slack, Jr.

Manufacture of floating soap. No. 2,377,424. Martin Ittner to Colgate-Palmolive-Peet Co.

Producing cement-fiber mass which comprises wetting excelsior with solution of sodium silicate; subjecting wetted excelsior to a solution of calcium chloride to form precipitate of calcium silicate as coating thereon, applying Portland cement. No. 2,377,484. Armin Elmendorf to The Celotex Corp.

Light-weight composition, having a lightweight aggregate bound together by a binder, the composition is rendered water-repellent by a waterproofing agent having no aggregate bonding properties. No. 2,377,491. Hobert Goodrich and Glenn Sucetti to Universal Zonolite Insulation Co.

Ink solution comprising water molybdic acid, mercuric chloride, copper sulphate, antimony trichloride, hydrochloric acid, sulphuric acid, and nitric acid. No. 2,377,593. Donald Vande Bunte to Packard Motor Car Co.

New dielectric composition for impregnation of cellulosic material comprising a liquid halogenated hydrocarbon dielectric stabilized with naphthalene to which has been added tetralin. No. 2,377,630. James Hyde to Sprague Specialties Co.

Depilatory pad for application to body comprising impermeable base section and a coating mounted thereon; said coating being made of plasticized rosin. No. 2,377,774. Maximilian Gotham.

Insecticide powder containing 80% powdered dextrin, 10% sodium fluoride and 10% pyrethrum. No. 2,377,798. Simon Marcovitch to The University of Tennessee Research Corp.

Printing ink comprising mineral ink, oil, an ester of polymerized rosin, and a pigment, said ink being characterized by decreased tendency to flow out from under type. No. 2,375,752. Irwin Clare to Hercules Powder Co.

Stabilization of pyrethrum preparations. No. 2,375,773. John de Jonge.

Stabilization of rotenone preparations. No. 2,375,774. John de Jonge.

Coated abrasive comprising backing, coating of abrasive grains held to said backing by an adhesive making coat, majority of said abrasive trains being oriented with their long axes at right angles to plane of the backing, a sizing coat of adhesive applied over said grains. No. 2,375,813. Nicholas Oglesby to Behr-Manning Corp.

Coated abrasive comprising reinforcing backing, layer of abrasive grains anchored thereto by coat of abrasive-holding adhesive interposed between grains and backing. No. 2,375,814. Nicholas Oglesby to Behr-Manning Corp.

Polishing composition characterized by ability to produce a haze-free, glossy surface on non-thermoplastic resinous finishes, which comprises vehicle containing liquid consisting of formamid, and a polishing abrasive dispersed in liquid consisting of a hydrated calcium silicate powder. No. 2,375,824. Albert Saunders and Loy Engle to Interchemical Corp.

Polishing composition characterized by ability to produce a haze-free, glossy surface on non-thermoplastic resinous finishes, which comprises a vehicle containing a liquid polyhydric alcohol of glycerol and ethylene glycol, and a polishing abrasive dispersed in liquid consisting of a hydrated calcium silicate powder. No. 2,375,825. Albert Saunders and Loy Engle to Interchemical Corp.

Manufacturing light-polarizing material from molecularly oriented sheet comprising a linear polyvinyl oxy compound, comprising baking said sheet, staining said sheet with solution comprising iodine, etc. No. 2,375,963. Alexander Thomas to Polaroid Corp.

Cleansing composition in dry form comprising mixture of water soluble fatty acid soap and a soap builder consisting of sodium borate having 1.1 to 2 mols of sodium oxide to one mol of boron trioxide. No. 2,376,096. Foster Dee Snell to Foster D. Snell, Inc.

Cementitious material, comprising water soluble, partial condensation product of ureaformaldehyde, soy-bean meal impregnated with cured phenol formladehyde resin, and monoammonium phosphate. No. 2,376,133. Henry Ford and Robert Boyer and Paul Bayer to Ford Motor Co.

Comparatively constant viscosity lubricating grease comprising polyalkyl phosphate and polymerized castor oil dissolved therein, and a lithium fatty acid soap. No. 2,376,312. John Morgan to Cities Service Oil Co.

Demothing product consisting of fragments of cedar wood impregnated with solution containing paradichlorobenzene, ethylene dichloride, hydrocarbon solvent, and glycerin, the glycerin component being sufficient to reduce volatilization of paradichlorobenzine and ethylene dichloride and to promote volatilization of natural volatile constituents of cedar wood. No. 2,376,327. Faw Chuck to Lindauer and Co.

Manufacture of abrasives upon downwardly faced adhesive backing, which includes directing, depositing and orienting abrasive particles by subjecting particles, during attachment to backing, to combined actions of contacting mechanical embedding force and electrical force. No. 2,376,342. Richard Carlton to Minnesota Mining & Manufacturing Co.

Manufacture of abrasives. No. 2,376,343. Richard Carlton to Minnesota Mining & Manufacturing Co.

Treating lubricating oil during its use in internal combustion engine, which comprises adding to oil a mixture of isopropyl alcohol and a carrier therefor to cause agglomeration of colloidal particles of foreign material. No. 2,376,418. Joel Clark and Harry Pierce; said Pierce to said Clark.

Producing a spray processed powdered soap which comprises discharging at temperature between 200 and 325° F. and a pressure between 40 and 300 lbs. per sq. in. drops of liquid soap comprising reaction product of caustic alkali and a rosin and a reaction product of a caustic alkali and a material selected from fats, oils, and fatty acids. No. 2,376,499. Paul Mosher to Hercules Powder Co.

Treating light oils produced in by-product coking of bituminous coal in order to obtain a water-soluble acid sludge. No. 2,376,644. Joseph Wells and Philip Wilson, Jr. to Carnegie-Illinois Steel Corp.

Fungicidal and bactericidal composition comprising mixture of alkali metal salts of pentachlorophenol and of 2-phenyl-monochlorophenol. No. 2,376,650. Donald Ballman to The Dow Chemical Co.

For tanning purposes, a mixture of water-soluble constituents of wood-tar having small quantities of internal and external esters and of salts of pyridic and quinoleic bases. No. 2,376,663. Charles Coutor.

Poultry litter comprising rounded mineral aggregates and finely divided inert material associated with a volatile disinfectant. No. 2,376,672. Luella Dreyling.

Making insecticide which comprises extracting vegetable material selected from pyrethrum, derris and cube in presence of formic acid with organic solvent nonreactive to acid, of group consisting of benzene, acetone and carbon tetrachloride. No. 2,376,702. Jean Komeda.

Insect control for cotton plants, which includes treating water suspension of calcium arsenate with solution of salt of heavy metal to reduce water-soluble As_2O_5 content to not over 1.6%. No. 2,376,740. Harold Waters and Charles Meadows to The Sherwin-Williams Co.

Producing lubricants and products for improving lubricants from aliphatic waxy material which comprises, subjecting said material to action of a silent electric discharge to form condensation products. No. 2,376,807. Mathias Pier and Friedrich Christmann.

Cement comprising mixture of synthetic rubber selected from chloroprene polymers and butadiene acrylic nitrile copolymers, and adhesive consisting of a thermo-setting synthetic resin and a volatile organic solvent for resin. No. 2,376,854. Seymour Saunders and Harry Morrison.

Coatings

Forming pile-surfaced material which comprises coating transfer surface with weak adhesive, depositing on coating a layer of pile-forming material in oriented relation with particles thereof normal to said surface, etc. No. 2,376,922. William King to Behr-Manning Corp.

Production of coatings, consisting of aqueous zein dispersion which comprises zein, sulfonated castor oil, urea, glycerine, butyl alcohol, and water. No. 2,377,237. Albert James to Corn Products Refining Co.

Coating composition comprising solvent and high-melting synthetic resin produced by reaction of a polyhydric alcohol and a polymeric distillation residue remaining after distillation of polymerized rosin under reduced pressure to remove volatile unpolymerized rosin fraction. No. 2,375,753. Irwin Clare to Hercules Powder Co.

Coating mixture for electrophoretically depositing electrically insulating material, the mixture consisting of carbon tetrachloride with castor oil added and particles of barium fluoride. No. 2,376,047. Roscoe George and Wilfred Hesselberth to Radio Corp. of America.

Coating composition comprising material selected from drying oils and semidrying oils and reaction product of a polyhydric alcohol and a conjoint condensation product of simultaneous reaction of rosin compound selected from rosin acids and lower monohydric alcohol esters thereof, an aldehyde, and an alpha, beta-unsaturated polycarboxylic acid. No. 2,376,823. Paul Scrutchfield to Hercules Powder Co.

Dyes, Stains

Color paste composition comprising oily vehicle having dissolved therein oil-soluble salt of a higher aliphatic ester of an aliphatic carboxylic acid, said ester containing a salt-forming radical of a polybasic oxygen-containing mineral acid in carboxylic acid part of molecule, and coloring matter insoluble in said vehicle. No. 2,377,172. Timothy Murphy to Allied Chemical & Dye Corp.

Producing monoethylaniline free from diethylaniline which comprises adding mixture of one part of ethyl alcohol with 2 to 5 parts of aniline in presence of sulfuric acid. No. 2,377,233. Alfred Hill and Ralph Sayre to American Cyanamid Co.

Azo compounds and material colored therewith. No. 2,375,804. James McNally and Joseph Dickey to Eastman Kodak Co.

Producing only positive azo dye images in a silver halide emulsion containing azo dye component fast to diffusion and selected from diazotizable amines and azo coupling components. No. 2,376,822. Wilhelm Schneider and Alfred Frohlich, and Gustav Neugebauer.

Equipment

Continuous filtration of solids from a mixture of solids and mother liquor by means of a continuous rotary drum filter, the filter drum comprising plurality of hollow segmental filter elements whose leading and trailing portions are in fluid communication through separate drain pipes with a filter valve. No. 22,646. Wynkoop Kiersted, Jr. to The Texas Co.

Mass spectrometer of fixed geometry, an ion detector, control device adapted to move beams comprising ions of a different mass-to-charge ratio transversely to and in contact with said detector at speeds which vary as inverse function of mass-to-charge ratio of ions, and ion current recorder connected to detector. No. 2,376,877. Robert Langmuir to Consolidated Engineering Corp.

Determining permeability of formation penetrated by bore of a well, which comprises introducing two immiscible fluids into well bore, one being of higher specific gravity and electrical conductivity than the other, etc. No. 2,376,878. Philip Lehnhard, Jr. to The Dow Chemical Co.

For sealing discs of container closures, a web of pulp board having on its face a film of a wax material, and a web of cheesecloth embedded in said film. No. 2,376,899. Iliya Bulatkin to Crown Cork & Seal Co. Inc.

Filter bed expansion control. No. 2,376,912. Walter Green to Infilco Inc.

Fluid proportioning apparatus. No. 2,376,917. Percy Hiltz to The Lummus Co.

Electrical insulating material comprising asbestos fibers, aluminous cement, a filler, and bituminous electrical insulating compound impregnating said mass. No. 2,376,919. Clyde Hutchcroft to Keasbey & Mattison Co.

Fractionating tower, a flat horizontal shower deck within tower having an imperforate liquid-collecting body portion extending from one side of tower halfway to opposite side of tower, etc. No. 2,376,923. Wheaton Kraft to The Lummus Co.

Fractionation column, an internal reinforcing ring for column secured to inner wall of the latter, a bubble cap deck within the column, etc. No. 2,376,940. Ralph Riemenschneider to The Lummus Co.

Water silencer. No. 2,377,001. Benjamin Graham.

Liner for dentures comprising methyl methacrylate resin plasticized by ester produced by reaction of glycerine with acetic acid. No. 2,377,041. Sam Rogover.

Composition for electric welding comprising magnesium silicate and hydrated lime, and including graphite. No. 2,377,048. George Smith.

Method of extraction which comprises continuously introducing volatile liquid solvent into one end of a closed horizontal channel and continuously removing miscella from the other end of the channel, etc. No. 2,377,135. Clarence Dinley and William McCracken to Detroit Rex Products Co.

Extraction apparatus having closed horizontal extraction channel having a conveyor therein; means for continuously introducing liquid solvent into one end of channel; a miscella outlet at opposite end of the channel so that a free space of large extent is left above conveyor, etc. No. 2,377,136. Clarence Dinley and William McCracken to Detroit Rex Products Co.

Liquid bath filter. No. 2,377,142. Clarence Glanzer to Air-Maze Corp.

Insulated electric cable comprising stranded conductor with a dielectric consisting of normally solid polymers of ethylene, etc. No. 2,377,153. Philip Hunter, Harold Allcock and Ronald Fairfield to Callender's Cable & Construction Co. Ltd.

Reflective vulcanizing chamber for treating materials under high gas pressure, having a corrugated metallic wall and internal heating elements surrounding inner working space; thermally reflective surface between heating elements and metallic wall, etc. No. 2,377,177. Hans Pfleumer to Rubatex Products, Inc.

Filtering apparatus of band-filter type for separating liquids or solutions from solid substances and washing latter. No. 2,377,252. Hans Lehrecke to Aktiebolaget Kemiska Patenter.

Apparatus for generating gas from liquefied petroleum fuel, a gas generating chamber; diaphragm means within chamber for controlling pressure therein; etc. No. 2,377,342. John Holicer.

Gauge for determining contents of a vessel under pressure of liquefied petroleum gas, a fixed tubular member having spaced perforations therein; a rotatable member encased by the tubular member, etc. No. 2,377,343. John Holicer.

Concentration control system comprising a solution container, a pair of electrodes exposed to solution, the latter with electrodes comprising part of a control circuit, and a second container including a concentrated make-np solution, etc. No. 2,377,363. Sidney Noble and William Wolgemuth.

Charging particles which comprises generating ionizing discharge in electric field, directing discharge into electric field of greater average strength than average strength of field from which ionizing discharge emanates to charge zone, and passing through gas containing suspended particles. No. 2,377,391. Harry White, one-half to Research Corp., and one-half to Western Precipitation Corp.

Humidity responsive apparatus including pair of spaced conductors and film of conductive organic hydrophilic colloid connecting said conductors. No. 2,377,426. Harold Kersten.

Treatment of filaments, fabrics and like having basis of organic derivative of cellulose for improving serimetric properties thereof, which comprises passing materials through a solution, consisting of 50 parts by volume of acetaldehyde and 50 parts of xylene. No. 2,377,434.

RAYMOND MULTI-WALL PAPER SHIPPING SACKS SPEED WAR PRODUCTION IN CHEMICAL INDUSTRY

They solve the packing and shipping problems of crushed, powdered and granulated chemicals. They check loss, damage and delay in the handling of these vital war materials. More than 200 chemicals are packed and shipped in Raymond Sacks.

THE RAYMOND BAG COMPANY - Middletown, Ohio

Arthur Lyem to Celanese Corp. of America.

Apparatus for producing metallic magnesium comprising vertical furnace shaft, a plurality of heating elements, tubular shields for elements, etc. No. 2,377,478. William Spencer Bowen.

Apparatus for drawing glass tubing. No. 2,377,494. Charles Greene to Corning Glass Works.

Utilizing catalyst fines produced in a moving bed granular catalyst system. No. 2,377,512. James Page, Jr. to Standard Oil Co.

Apparatus for distilling oil shale and the like. No. 2,377,518. Elmer Records and James Louttit.

Apparatus for separating solid particles from liquid a centrifugal separating chamber, etc. No. 2,377,524. Edward Samson and Alfred Croup to Hammermill Paper Co.

Valve assembly for controlling outflow from body of liquid through a pipe which has an outlet orifice; a float hinged to pipe so that as level of liquid falls and rises float will turn about its hinge, etc. No. 2,377,537. John Churchill to D. Napier & Son Ltd.

Apparatus for liquid treatment comprising a tank, a peripheral wall of said tank, an annular vertical baffle concentric with wall, etc. No. 2,377,545. John Felsecker to Graver Tank & Mfg. Co. Inc.

Liquid and gas separator. No. 2,377,549. Eric Gustafsson and John Baur to Binks Manufacturing Co.

Resolving a water-in-oil type of emulsion, which includes subjecting emulsion to electric field to coalesce a portion of dispersed water into gravitationally separable masses, etc. No. 2,377,565. Louis McDonald to Petrolite Corp. Ltd.

Butyrometer comprising wide body having an open lower end and narrow neck communicating with interior of body and open at upper end, etc. No. 2,377,586. Alf Stigen to Aktiebolaget Separator.

Apparatus for determining hardness and related properties of plastic and elastic materials, comprising a thermally insulated, hermetically closed container, etc. No. 2,377,590. Joseph Talalay to Converse Rubber Co.

Apparatus for carbonating a limed sugar solution. No. 2,377,634. Wilmot Kidd to The Foxboro Co.

Apparatus for treating filamentary material in form of threads or bundles with liquids, means for forming running length of said material at angle to vertical, a nozzle arranged adjacent said running length for directing a jet of liquid into contact with material, etc. No. 2,377,655. Richard Stanley and Henry McDermott to American Viscose Corp.

Electrical apparatus comprising conducting elements and a liquid medium insulating one from other, said medium comprising a liquid organosiloxane whose organic radicals are attached to silicon through carbon-silicon linkages. No. 2,377,689. James Hyde to Corning Glass Works.

Separator of vortex type for paper pulp. No. 2,377,721. Harold Scott to Vickerys Ltd.

Separating selected fractions from mixture of fluids of different boiling points in a series of fractionating zones. No. 2,377,736. John White to Universal Oil Products Co.

Apparatus for producing continuous fine glass fibers simultaneously from separate sources comprising a pair of metal-walled glass melting bushings disposed in side by side relation and having openings therein for discharging fine streams of molten glass, etc. No. 2,377,772. Ed Fletcher and Nelson Leedy to Owens-Corning Fiberglas Corp.

Apparatus for effecting contact of a gas containing acid constituent and liquid solvent for acid constituent, which includes a tower adapted to receive liquid at top and the gas at bottom, etc. No. 2,377,781. George Hebbard to The Dow Chemical Co.

Operating an electrolyzer, comprising separately circulating normal alkali carbonate solution through anolyte chamber of electrolytic diaphragm cell while electrolyzing solution and while applying heat to solution in anolyte chamber to separate therefrom carbon dioxide, etc. No. 2,377,823. Hubert Stewart to Koppers Co. Inc.

Apparatus for producing carbon black comprising an unobstructed intermediate reactor having a closed inlet end wall carrying an inlet tube, etc. No. 2,375,797. Joseph Krejci to Phillips Petroleum Co.

Vortex separator apparatus for treating paper pulp. No. 2,375,826. Harold Scott to Vickerys Ltd.

Liquid heating apparatus containing combination of a combustion chamber, a pipe for conducting gases of combustion below surface of a liquid to be heated, etc. No. 2,375,840. Regner Ekstrom, Jr. to Elematic Corp.

Liquid heating apparatus, combination of a tank for containing liquid to be heated, an electric heater extending inwardly within an upper region of tank, etc. No. 2,375,871. Joseph Reifenberg to Westinghouse Electric & Manufacturing Co.

Color and shade comparison apparatus, comprising a table having an exposure orifice, an instrument panel at back of said table, etc. No. 2,375,889. Wilbert Benning to Pacific Clay Products Co.

Electrical resistance thermometer comprising electrically non-conductive heat conducting container, an electrically conductive non-electrolytic liquid in container adapted to vary in electrical conductivity in acordance with variations in temperature thereof. No. 2,375,892. George Bouyoucos to Michigan State Board of Agriculture.

Crystallizing apparatus comprising crystallizing chamber and a superimposed gas chamber, disturbing means for causing jets of a solution of a material to be crystallized to pass through said gas chamber, etc. No. 2,375,922. Finn Jeremiassen.

Syringe comprising an open-ended cylindrical body-portion provided with external threads adjacent each end, etc. No. 2,375,929. Franz Lautenschlager.

Apparatus for continual metallurgical treatment of raw ore materials in a flame chamber. No. 2,375,932. Julius Lohse.

Apparatus for analyzing gases for their content of combustible constituents present therein in minute amounts, in combination, means for separating and isolating from said gas said combustible constituents, etc. No. 2,376,145. Leo Horvitz.

Device for producing stepped intensity light beam comprising light source, a linear series of integrating tubes narrow in both transverse dimensions and pointing toward light source, light filter which is optical wedge having continuously graded density and means for rotating filter in its own plane. No. 2,376,166. Oran Miller to Eastman Kodak Co.

Ionization chamber adapted for detecting radiations caused by nuclear disintegrations that comprises housing, ionizable medium in said housing, coat of insulating varnish carried by inner wall of housing, electrodes disposed within ionizable medium, etc. No. 2,376,196. Serge Scherbatskoy to Well Surveys, Inc.

Degassing liquid in a container which comprises reciprocating a cavitator vertically in liquid in rapidly repeated cycles. No. 2,376,221. Theodore Baker to Hartford-Empire Co.

Pipette consisting of tube composed of thin flexible strip of cellulose plastic material helically wrapped to a uniform internal diameter, etc. No. 2,376,231. David Cohn.

Mold for preparation of synthetic resinous object by polymerization of a resin-forming liquid comprising plaster body having mold cavity therein, surfaces of cavity being coated with a film of water-soluble methyl cellulose or water-soluble salts of carboxy methyl cellulose. No. 2,376,244. Richard Freeman and Gordon Schmelter to The Dow Chemical Co.

In catalytic converter, a housing having a chamber therein, a heat jacket surrounding chamber, a heat transfer element in chamber, etc. No. 2,376,271. Joseph Pecker to Machine & Tool Designing Co.

Apparatus for processing latex containing a volatile stabilizing agent. No. 2,376,281. John Scott, Eugene Luxenberger and George Blair to United States Rubber Co.

In apparatus for heating water to remove scale-forming impurities, in combination, a tank having a reservoir in base thereof and inlet above reservoir for fluid heating medium, etc. No. 2,376,298. Edward Welp to Graver Tank & Mfg. Co. Inc.

Apparatus for liquid contact for fractionating, etc. No. 2,376,341. Robert Burk and Thomas Walsh to The Standard Oil Co.

Container for storage of fluid medium, a flow control device attached to said container and having valve means for regulating flow of medium from container through said device. No. 2,376,353. Harry Grant, Jr. and William Thomsen to Specialties Development Corp.

Temperature control of catalytic operations. No. 2,376,356. James Harrison to Houdry Process Corp.

Apparatus for effecting contacting reactions. No. 2,376,365. Raymond Lassiat to Houdry Process Corp.

Geochemical prospecting which comprises placing an unsealed container below surface of earth by a tool having provision for exhausting air from container and sealing it, exposing interior of container to surrounding soil, aspirating liquids and gases from soil into container. No. 2,376,366. Reed Lawlor and Herbert Metcalf to Consolidated Engineering Corp.

Sampling a distillate well stream containing both liquid and gas phases including, concurrently removing a predetermined cross-sectional portion of said stream completely within comfine of said stream, etc. No. 2,376,542. Garman Kimmell.

System for storing and dispensing liquefied gas. No. 2,376,628. James Shanley to Phillips Petroleum Co.

Apparatus for carrying out chemical reactions which comprises a casing having side and top and bottom end walls, upper and lower transverse partitions extending across casing forming a reaction chamber therebetween for containing contact material, etc. No. 2,376,629. Rowland Stanfield and Leonard Doolan, Jr. to Tide Water Associated Oil Co.

Apparatus for controlling flow of condensate from evaporator for sugar solutions to source of feed water for a boiler, which includes a tank having a condensate inlet, etc. No. 2,376,694. Allen Hewlett.

Regenerative underfired coke oven battery. No. 2,376,718. Carl Otto to Fuel Refining Corp.

Detachable fluid-tight connector for a filter element comprising hollow body of porous material open at one end, etc. No. 2,376,739. John Walker, Jr. to Selas Corp. of America.

Electrical resistor composed of compressed mixture of reduced metallic iron in granular form and titanium oxide, said resistor having flat-curve voltage-current characteristic. No. 2,376,757. Adolph Chanosky.

Apparatus for measuring a liquid out of contact with air, which comprises a measuring chamber of known capacity, a reservoir for holding liquid to be measured, etc. No. 2,376,772. Edmund Hodson and Robert Soutter to Courtaulds Ltd.

Apparatus for separating gases from liquids without application of heat to liquid, comprising, a tank, means for supplying a liquid carrying gases therein to upper portion of the tank, etc. No. 2,376,794. Leon McCulloch to Westinghouse Electric & Manufacturing Co.

Explosives

Manufacture of ammounition priming compositions by water wet mixing of ingredients, improving workability of mixture which comprises adding a surface active agent to change interfacial tension of moistening ingredients. No. 2,377,670. Philip Burdett and Matthew Maughan to Remington Arms Co. Inc.

Shot shell wad having a lubricant, rendering wad nonshot sticking and being non-running, and composed of 80% oleostearine and 20% of a hydrogenated animal fat. No. 2,377,683. Walter Finlay to Remington Arms Co. Inc.

Fine Chemicals

Amino alkyl ester of a nuclearly amino substituted phthalic acid and its non-toxic acid addition salts. No. 2,376,860. Frederick Blicke to The Regents of the University of Michigan.

Ethers of endoethylene hydroxycyclopentanoindane. No. 2,376,865. Herman Bruson to The Resinous Products & Chemical Co.

Halogen substituted acylamino sulphonic acids of aromatic series, and their manufacture. No. 2,376,930. Henry Martin, Hans Zaeslin and Rudolf Hirt and Alfred Staub to J. R. Geigy A. G.

Production of 2,5,6-trimethyl-3-phytyl-1,4-benzoquinone. No. 2,376,984. Max Tishler to Merck & Co. Inc.

Formation of pantothenic acid, which comprises preparing nutrient medium containing molasses, yeast assimilable nitrogen source, and beta alanine, seeding with a Saccharomyces cerevisiae yeast. No. 2,377,044. Alfred Schultz and Lawrence Atkin and Charles Frey to Standard Brands Inc.

Derivative of alpha, gamma-dihydoxy-beta, beta-dimethyl-butyric acid, consisting of d(+)-2,4-dihydroxy-3,3-dimethyl-butyric acid — (3', 4'-dihydroxybutyl) amide. No. 2,377,105. Tadeus Reichstein to Haffman-La Roche, Inc.

New sulfonated anthraquinone compounds. No. 2,377,145. Ernst Gutzwiller to Sandoz A. G.

Beta, beta'-iminodipropionimide. No. 2,377,147. Roy Hanslick to American Cyanamid Co.

Preparing 3,3'-dichloroindanthrone in which 3,3'-dibromoindanthrone is reacted with chlorine gas in inert organic reaction medium. No. 2,377,158. David Klein to E. I. du Pont de Nemours & Co.

Seed borne disease control composition containing from .1% to 10% of guanidine pentachlorphenate. No. 2,377,167. Vartkes Migrdichian to American Cyanamid Co.

Preparing directly from gluten, solution of zein-containing proteins in solvent or mixture of solvents comprising a glycol ether as solvent constituent for zein-containing proteins. No. 2,377,290. Roy Coleman to Time, Inc.

Preparation of zein solutions directly from gluten. No. 2,377,291. Roy Coleman to Time, Inc.

From Official Gazette—Vol. 574, Nos. 3, 4, 5—Vol. 575, No. 1 (May 15-June 5)—p. 594

Racemizing dextro-rotatory-alpha-hydroxy-beta, beta-dimethyl-gamma-butyrolactone that comprises heating lactone, under anhydrous conditions and in absence of solvent, with a substance selected from alkali metal carbonates, alkaline earth hydroxides and alkaloids. No. 2,377,390. John Weijlard and John Messerly to Merck & Co. Inc.

Reacting a carboxylic acid amidine with compound of stated formula. No. 2,377,395. Hans Andersag and Kurt Westphal to Winthrop Chemical Co. Inc.

Preparing beta-aminopropionic acid which comprises heating mixture of acrylonitrile and aqueous ammonium hydroxide. No. 2,377,401. Gustaf Carlson and Charles Hotchkiss to Lederle Laboratories, Inc.

Production of cyclopentanone by catalytic dehydrogenation of cyclopentanol, which comprises passing cyclopentanol in vapor phase over catalyst comprising a copper-zinc alloy. No. 2,377,412. Frederick Frey to Phillips Petroleum Co.

Ether of a cyclic ketal obtained by reacting glyceryl alpha mono-isopropyl ether and cyclic ketone containing 9 carbon atoms. No. 2,377,568. Kenneth Marple to Sheill Development Co.

Preparing trans-quinitol diacetate which comprises catalytically hydrogenating 3,6-epoxycyclohexene, and effecting fission of ether linkage by reacting hydrogenated intermediate with acetic anhydride. No. 2,377,571. Walter Nudenberg to the Secretary of Agriculture of the United States of America.

Manufacture of chlorosulphonic acid which comprises causing stream of hydrochloric acid-containing gases and a stream of sulphur trioxide-containing gases to intermingle. No. 2,377,642. Ronald Mooney and Godfrey Wentworth to Imperial Chemical Industries Ltd.

Manufacture of d-psicose. No. 2,377,653. Louis Sattler to The New York Sugar Trade Laboratory, Inc.

Producing highly chlorinated copper phthalocyanine which comprises heating copper phthalocyanine in a closed vessel with liquid chlorinating agent consisting of sulfur dichloride, in presence of catalyst comprising ferric chloride; then passing a stream of chlorine gas through mass to distill off the liquid diluents and by-products, and recovering residual color mass. No. 2,377,685. Arthur Fox and Kenneth Johnson to E. I. du Pont de Nemours & Co.

Preparing benzil by oxidation of benzoin which comprises contacting benzoin starting material with an aqueous copper sulfate-pyridine solution, etc. No. 2,377,749. Charles Bordner to E. I. du Pont de Nemours & Co.

Making fluorenones which comprises heating ortho-halo-diaryl ketone of benzene series with alkali metal hydroxide in presence of catalyst which contains metallic iron. No. 2,377,751. Edgar Britton, Clarence Moyle and Fred Bryner to The Dow Chemical Co.

Preparation of adiponitrile which comprises introducing adipic acid and a mononitrile of an aliphatic organic acid into a reaction mixture in presence of acid catalyst. No. 2,377,795. Donald Loder to E. I. du Pont de Nemours & Co.

Manufacture of pantothenic acid and the salts thereof. No. 2,377,814. Otto Schnider to Hoffmann-La Roche, Inc.

Producing a metallic phthalocyanine which comprises reacting by heat cyanuric acid and a metallic compound reactable therewith with a compound capable of producing an aromatic ortho-dinitrile by dehydration and reaction with ammonia. No. 2,375,780. Vito Giambalvo to Interchemical Corp.

Monomeric bis quaternary ammonium salts in which nitrogen atoms are separated by a decamethylene chain, and each nitrogen atom carries two alkyl groups of lower molecular weight, a straight chain alkyl group of ten carbon atoms, and an anion. No. 2,375,853. James Kirby and John Lontz to E. I. du Pont de Nemours & Co.

Producing thiocholesterol which comprises hydrolyzing a thiocholesterol having an acid group substituted on 3-position. No. 2,375,873. Hans Rosenberg and Stockton Turnbull, Jr. to E. I. du Pont de Nemours & Co.

Cholesterol-S-pseudo-thiourea hydrohalide. No. 2,375,874. Hans Rosenberg and Stockton Turnbull, Jr. to E. I. du Pont de Nemours & Co.

Producing pantothenic acid comprising reacting aqueous solution of beta-alanine, a base, the metal component of said base being selected from alkali and alkaline earth metals, and alpha-hydroxy-beta. No. 2,375,885. Sidney Babcock, Jr. to The Regents of the University of California, Berkeley, Calif.

Substituted naphthenyl hydroxy methane phosphonic acids. No. 2,376,130. Joseph Dickey and James McNally to Eastman Kodak Co.

Forming color-correction mask for a photographic color film having superposed dye images. No. 2,376,132. Ralph Evans to Eastman Kodak Co.

Preparing substance of general formula RSH where R is a member of radicals of cysteine and glutathione except sulfhydril group SH from solution containing oxidized form R-S-S-R. No. 2,376,186. Louis Rapkine.

Producing p-cymene which comprises passing vapors of monocyclic terpene over catalyst comprising oxide of chromium and oxide selected from copper, tin and zinc. No. 2,376,252. Washington Hull to American Cyanamid Co.

Production of hydrogen peroxide, which comprises mixing propane with oxygen, etc. No 2,376,257 Antoine Lacomble to Shell Development Co.

Compositions from vulcanizable gums and making same obtained by mixing rubber with aromatic phosphorus halide. No. 2,376,264. George Martin to Monsanto Chemical Co.

Producing 1-halo-4,8,12-tri-methyltridecane. No. 2,376,286. Lee Smith and George Rouault to Regents of The University of Minnesota.

Producing p-cymene which comprises vaporizing a monocyclic terpene over catalyst mass comprising Cr_2O_3 on alumina. No. 2,376,308. James Dixon to American Cyanamid Co.

Producing beta-alanine comprising reaction of methyl acrylate with 10% aqueous ammonium hydroxide solution, etc. No. 2,376,334. Sidney Babcock, Jr. and Bernard Baker to The Regents of the University of California.

New compound, a dihydronorpolycyclopentadienyl thioether, the addition-rearrangement product of a crystalline polycyclopentadiene, etc. No. 2,376,340. Herman Bruson and Thomas Riener to The Resinous Products & Chemical Co.

Producing 7-hydroxy-cholesterol-7-monobenzoate which comprises partially saponifying 7-hydroxy-cholesterol-dibenzoate with alcoholic caustic. No. 2,376,563. Daniel Terry to E. I. du Pont de Nemours & Co.

Producing isocytosine. No. 2,376,637. Edmond Tisza and Bernard Duesel and William Oroshnik to Nepera Chemical Co. Inc.

Preparing an alkyl ester of an alpha-beta unsaturated monocarboxylic acid. No. 2,376,704. Frederick Kung to The B. F. Goodrich Co.

Production of ketene which comprises subjecting acetone vapor to cracking temperature in contact with alloy comprising aluminum and copper. No. 2,376,748. Francis Atwood to Atlantic Research Associates, Inc.

Reaction product of alkyleneamine with ammonium thiocyanate. No. 2,376,796. Roger Mathes to The B. F. Goodrich Co.

Carbalkoxylating organic compound of type $X.CH_2.CO_2R$, where X is an alkene radical and R is an alkyl radical, which comprises mixing with an anhydrous alkali metal alcoholate and large excess of a dialkyl carbonate. No. 2,376,837. Vernon Wallingford and August Homeyer to Mallinckrodt Chemical Works.

Isolating a hetero-albumose renal extract of class of conjugated proteins. No. 2,376,841. Clarence Wolf.

Foods

Liquid food product for farm animals consisting yeast free from fermenting enzyme and molasses. No. 2,377,008. Herman Heuser; Irene Heuser administratrix of said Herman Heuser, deceased.

Preparing a concentrated liquid egg white. No. 2,377,644. Clinton Parsons and Leon Mink to Industrial Patents Corp.

Milling to recover high vitamin wheat fraction comprising selecting tailings stream leading to shorts and red dog and having a thiamin content several times that of whole wheat, and sifting out crude fiber. No. 2,377,741. John Andrews and Reginald Sherwood to General Mills, Inc.

Producing a lacteal food product which comprises generating a flowing unfrozen stream of liquid containing lacteal, foam forming food solids; and incorporating a gas by aspirating action of stream to form a food foam. No. 2,375,833. Radcliffe Morris Urquhart.

Producing dry product from leafy portion of cereal grass from which is brewed potable beverage, comprising contacting grass with an edible acid neutralizing the acid in situ and drying. No. 2,376,049. William Graham, Jr. and Elroy Frye to American Dairies, Inc. and The Quaker Oats Co.

Dehydrating vegetable and other moisture-containing material without removing volatile flavoring substances therefrom comprising moving silica gel in an endless path through a plurality of serially positioned dehydrating zones and an activating zone, etc. No. 2,376,095. Mark Shoeld to The Davison Chemical Corp.

Preserving perishable foodstuff by refrigeration which includes providing flexible moisture impermeable envelope. No. 2,376,583. Henri de Poix to Dewey & Almy Chemical Co.

Preparing soft curd milk which will not flake or curdle on being brought to boiling temperature, is free of cooked flavor, and has well defined cream line. No. 2,376,693. Raymond Helmer and Merle Farnham to Chr. Hansen's Laboratory, Inc.

Preparing pure crystalline rennin from a rennin extract. No. 2,376,848. Cloyce Hankinson to Carnation Co.

Industrial Chemicals, Inorganic

Regenerating a zeolite comprising contacting with dilute solution of a strong mineral acid and separately with dilute solution of a sodium salt of strong mineral acid. No. 2,376,914. Hilding Gustafson to Infilco Inc.

Chlorine dioxide manufacture. No. 2,376,935. Sven Persson to Aktiebolaget Duba.

Making fluxing lime, including reducing a high calcium calcined lime to small particles; mixing particles with liquid hydrocarbon binder adapted to prevent air-slaking of lime and compressing. No. 2,376,998. William Fulton.

Preparing levigated alumina for storing in water suspension. No. 2,377,057. Joseph Vilella to United States Steel Corp. of Delaware.

Recovering aluminum chloride from complexes consisting of aluminum chloride and carbonaceous material. No. 2,377,090. Thomas McCulloch to Standard Oil Development Co.

Separation of chlorine and sulphur dioxide. No. 2,377,138. James Farrell and William Eichelberger to The Solvay Process Co.

Preparing sulphuryl chloride, comprising reacting sulphur dioxide and chlorine in presence of catalyst comprising carbon, impregnated with metal salt of inorganic acid. No. 2,377,217. Michael Dvornikoff and George Taylor to Monsanto Chemical Co.

Aqueous drilling mud modified by addition of water-soluble metaborate to precipitate magnesium present soluble in the mud. No. 2,377,309. Donald Butler, John Herold and Vernon Zacher to Tide Water Associated Oil Co.

Producing a water dispersible aluminum hydroxide. No. 2,377,547. Walter Fuchs.

Catalyst comprising substrate of flat highly adsorptive plates, flakes or sheets of pure silica united with magnesia. No. 2,377,577. Robert Ruthruff.

Making magnesia from dolomite. No. 2,377,592. Alfred Thomsen.

Precipitating cobalt as a hydroxide which comprises adding hydrated nickel oxide to aqueous solution containing soluble cobalt salts to precipitate a hydroxide of cobalt. No. 2,377,832. Albert Wallis and DeWitt West to The International Nickel Co. Inc.

Treating salt mixture consisting of alkali metal nitrate and nitrite which has been maintained in circulation in a molten state in indirect heat transfer system and in which alkalinity and melting point have increased as a result of such use. No. 2,375,758. John Bates to Houdry Process Corp.

Treating alkali metal nitrate and nitrite salt composition which in use is maintained in circulation in a heat transfer system in molten state. No. 2,375,759. Vladimir Kalichevsky, Frederick Ray, and John Payne to Socony-Vacuum Oil Co. Inc.

Maintaining flow characteristics of a circulating indirect heat exchange system in which a heat transfer salt is utilized, which comprises employing salt comprising potassium and sodium as cations and nitrate and nitrite as anions. No. 2,375,760. Frank Fahnestock to Socony-Vacuum Oil Co. Inc.

Treating salt mixture consisting of alkali metal nitrate and nitrite which has been maintained in circulation in an indirect heat exchange system and in which melting point has increased as a result of such use, comprising contacting said molten mixture with a reducing agent. No. 2,375,761. John Bates to Houdry Process Corp.

Manufacture of anhydrous calcium nitrate, which comprises mixing together concentrated calcium nitrate solution with anhydrous solid calcium nitrate. No. 2,375,898. Hendrik de Bruijn and Mathijs Plusje.

Converting ammonium alum to granular alumina which comprises passing solution of ammonium hydroxide and ammonium sulfate through thick stationary bed of ammonium alum crystals from one side to other. No. 2,375,977. Reginald Davies, Henry Dering and Thomas Parker to Pochin & Co. Ltd.

Recovering pure ammonium sulphate from ammonium sulphate contam-

From Official Gazette—Vol. 574, Nos. 3, 4, 5—Vol. 575, No. 1 (May 15-June 5)—p. 595

inated with one of alkali metal and alkali earth metal salts. No. 2,376,045. Gant Gaither.

Hard bonding heat resisting material comprising mixture of high ratio potassium silicate solution embodying more than two parts silica to one part potassium oxide and low ratio potassium silicate solution, admixture of aluminum silicate, and wetting agent. No. 2,376,163. Leopold Metzger to Industrial Abrasives, Inc.

Lead sulphide catalyst comprising carrier consisting of sized particles of material selected from blast furnace slag and carborundum, said particles being covered with thin layer of sodium silicate binder and exposed outer adherent coating of lead sulphide. No. 2,376,223. Richard Bender to Sinclair Refining Co.

Concentrating sulphide ore which comprises subjecting ore in pulp to a froth flotation operation in presence of a compound. No. 2,376,242. Arthur Fischer to Minerec Corp.

Producing alumina from argilaceous material high in silica. No. 2,376,696. Arthur Hixson and Ralph Miller to The Chemical Foundation, Inc.

Industrial Chemicals, Organic

Preparing carbonaceous base exchange material comprising treating carbonaceous material with acid to partially sulfonate material, and thereafter treating with acid to complete sulfonation of carbonaceous material. No. 2,376,896. Abraham Behrman to Infilco Inc.

Distillation of fermented butyl mash containing solid organic material that causes excessive foaming during distillation, preventing foaming which includes injecting steam directly into fermented mash prior to distillation to raise temperature to that at which said solid material will coagulate. No. 2,376,898. Benjamin Boeckeler and Edward Lummus and Alexander Nansen to The Lummus Co.

Catalytic production of vinyl esters, comprising reacting acetylene hydrocarbon with compound containing a free carboxylic group, in presence of a mercury salt of a fluorophosphoric acid. No. 2,376,964. Bertil Groth and Stig Johanson.

Forming 1,3-butadiene which comprises passing vapor containing acetaldehyde and ethylene over catalyst having base consisting of metal selected from aluminum, magnesium and zinc, said base being coated with metal capable of forming heavy metal acetylide, and oxide of family A of group VI metal. No. 2,377,025. Harry Miller to National Agrol Co. Inc.

Dehydrating alcohols to produce corresponding olefins which comprises passing vapors of alcohol over a catalyst consisting of gel composed of mixture of silica and oxide of aluminum or thorium. No. 2,377,026. Hoke Miller to Air Reduction Co. Inc.

Fatty product stabilized against development of rancidity by, p-amino benzoic acid and compound having ene-diol grouping. No. 2,377,029. Frank Norris to General Mills, Inc.

Fatty product containing as antioxidants compound having ene-diol grouping and compound selected from morpholine, mono-, di- and triethanolamines. No. 2,377,030. Frank Norris to General Mills, Inc.

Oleaginous material stabilized against rancidity by, compound containing ene-diol group, p-amino-benzoic acid, and a compound selected from chroman-5, 6-quinones, hydroxychromans, the hydroxychromenes, the hydroxycoumarans, hydroxycoumarones. No. 2,377,031. Frank Norris to General Mills, Inc.

Diene reaction products and process. No. 2,375,937. Alexander Miller and Theodore Bradley to American Cyanamid Co.

Electrodecantation of an irreversibly coagulable aqueous colloidal dispersion in a cell having a membrane impervious to colloidal particles and at a potential which would form a coagulated layer on membrane, which comprises inhibiting formation of irreversibly adhering deposit on membrane by dispersing in said dispersion a compound which includes a hydrophilic portion and a hydrophobic portion. No. 2,375,957. Paul Stamberger.

Film forming or coating composition formed of reaction product of zein and furfural, nitro-cellulose, ethyleneglycol monoethyl ether, butanol, ethyleneglycol monobutyl ether, and plasticizer (optional). No. 2,375,978. John DeVine.

Polymerizing monomeric material containing conjugated butadiene which comprises carrying out polymerization in presence of aryl azo triaryl methane. No. 2,375,987. Benjamin Garvey, Jr. to The B. F. Goodrich Co.

Polymerizing monomeric mixture containing conjugated butadiene and unsaturated organic compound, which comprises adding aliphatic diazo compound containing diazo grouping —N=N— before polymerization No. 2,376,014. Waldo Semon and Charles Fryling to The B. F. Goodrich Co.

Polymerization of unsaturated organic compounds containing a $CH_2{=}C$ group. No. 2,376,015. Waldo Semon to The B. F. Goodrich Co.

Producing keto ester of an acrylic acid which comprises reacting an alpha chlor ketone with an alkali metal salt of acrylic acid in solution. No. 2,376,033. Albert Clifford to Wingfoot Corp.

Reacting diacetone amine and hydrogen at superatmospheric pressure in presence of Raney nickel to produce a reaction mixture containing diacetone alkamine. No. 2,376,054. Vernon Haury to Shell Development Co.

Production of low-boiling diolefin hydrocarbons from more saturated hydrocarbons of 4 to 5 carbon atoms per molecule. No. 2,376,059. Jean Jones to Phillips Petroleum Co.

Preparing an alpha, beta unsaturated carboxylic acid the beta carbon atom of which carries substituent other than hydrogen. No. 2,376,067. John Long to Wingfoot Corp.

Producing aldol by condensation of acetaldehyde. No. 2,376,070. Floyd Metzger to Air Reduction Co. Inc.

2-Chlorobutene-2 containing stabilizing quantity of a quinone dissolved therein. No. 2,376,075. Rupert Morris and Edward Shokal to Shell Development Co.

Preparation of alkylated aromatic compounds wherein alkylating agent selected from lower olefins and lower alkyl monohalides is reacted with aromatic compound selected from mononuclear aromatic hydrocarbons and halo-hydrocarbons in presence of organo-metal halide complex catalyst of Friedel-Crafts type to form a crude alkylated product containing hydrogen halide, the step of removing dispersed organo-metal halide complex catalyst. No. 2,376,088. Harold Robinson to The Dow Chemical Co.

Ester of a monoalkyl cyclohexanol and a thiocyanosubstituted aliphatic carboxylic acid. No. 2,376,105. Paul Williams to Shell Development Co.

Aminating a dihydric phenol comprising condensing, in aqueous media, a dihydric phenol with an aminating agent selected from ammonia, primary amines and secondary amines, in presence of an ammonium salt. No. 2,376,112. Frederic Bean and Thomas Donovan to Eastman Kodak Co.

Feeding powdered clay catalyst into a cracking zone containing hydrocarbon vapors preheated to cracking temperatures. No. 2,376,139. Charles Hemminger to Standard Oil Development Co.

Reacting gasiform reactants in presence of a powdered catalyst suspended in a reactant. No. 2,376,190. Bruno Roetheli and Walter Scharmann to Jasco, Inc.

Dehydrogenating butylene to butadiene which comprises discharging the preheated butylene into a reaction zone. No. 2,376,191. Bruno Roetheli and Walter Scharmann to Jasco, Inc.

Producing olefinic compounds which comprises passing halogenated hydrocarbon vapors thru a noble metal reactor. No. 2,376,205. Miller Swaney and Leland Beach to Jasco, Inc.

Polymerizing monomeric mixture of vinylidene chloride and a butadiene-1, 3 hydrocarbon in presence of a peroxide catalyst. No. 2,376,208. Harold Tucker to The B. F. Goodrich Co.

Effecting desired change in piezo-electric vibration frequency of crystalline quartz resonator elements which consists in immersing elements in aqueous solution saturated with hydrofluoric acid and ammonium bifluoride. No. 2,376,219. Arthur Winslow to General Electric Co.

Removing gel forming components from crude, solid poly-ethers of pentaerythritol obtained as reaction byproduct in production of pentaerythritol, which comprises treating crude with acidified solvent. No. 2,376,224. Isidor Bernstein and Herman Lanson to H. D. Roosen Co.

Production of a resazurin preparation which comprises oxidising mixture of resorcinol and nitrosoresorcinol with manganese dioxide and sulphuric acid in presence of acetone or methyl ethyl ketone. No. 2,376,283. Wallace Short and Peter Oxley to Boots Pure Drug Co. Ltd.

Converting p-menthane in vapor phase to dimethyl styrene. No. 2,376,309. James Dixon to American Cyanamid Co.

Producing 4-alpha-dimethylstyrene. No. 2,376,310. James Dixon to American Cyanamid Co.

Metal-organic compound selected from stannous salt of paraffin wax-substituted phenoxy, acetic acid disulfide; cobaltous salt of paraffin wax-substituted phenoxy acetic acid disulfide; cobaltous salt of paraffin wax-wax-substituted phenoxy benzoic acid disulfide. No. 2,376,313. Orland Reiff to Socony-Vacuum Oil Co. Inc.

Effecting conversion of organic compound in presence of concentrated hydrofluoric acid as a conversion catalyst, the improvement for avoiding contamination of products of said conversion by sulfur compounds resulting from sulfur dioxide present as impurity in make-up hydrofluoric acid catalyst. No. 2,376,328. Ralph Cole to Phillips Petroleum Co.

Solid 1,3-dioxolane polymer, having molecular weight between 1,000 and 200,000, containing 0.1 to 5.0 parts of symmetrical di-beta-naphthyl-para-phenylenediamine per 100 parts of polymer. No. 2,376,354. William Gresham to E. I. du Pont de Nemours & Co.

Production of oxygen-containing terpene products. No. 2,376,369. Donald Lister to Hercules Powder Co.

Preparing primary, acetone soluble, high grade, low viscosity acetylation product of a material selected from starch and dextrin, which comprises reacting quantity of material having moisture content of 7-12% with acetic anhydride with sulfuric acid as catalyst. No. 2,376,378. John Murray.

Producing pyrazolone derivative, which comprises condensing a hydrazine selected from alkyl hydrazines, aryl hydrazines, and heterocyclic hydrazines, with ethyl (beta-ethoxy-beta-imino) propionate. No. 2,376,380. Henry Porter and Arnold Weissberger to Eastman Kodak Co.

Producing novel surface active compounds which comprises reacting compound selected from rosin; hydrogenated, dehydrogenated, disproportionated and decarboxylated rosin, etc., with a strong sulfonating agent and a compound selected from aliphatic alcohols and alkenes. No. 2,376,381. Donald Price and Everette May to National Oil Products Co.

Producing novel rosin derivatives, which comprises condensing compound selected from rosin; free acids corresponding to rosin and hydrogenated, dehydrogenated, and disproportionated rosin; and esters of aforementioned acids; with alkyl halide containing in presence of a Friedel-Crafts catalyst. No. 2,376,382. Donald Price and Everette May to National Oil Products Co.

Ketone consisting of compound selected from 4-methoxy-4'-acetyl-alpha-alpha'-diethyl-dibenzyl, 4,4'-di-hydroxy-3,3'-diacetyl-alpha alpha'-diethyl-stilbene, etc. No. 2,376,415. George Brownlee and Walter Duffin to Burroughs Wellcome & Co. Inc.

Producing sodium hydrosulphide which comprises forming saturated aqueous solution of Na_2CO_3, contacting solution with pure H_2S gas. No. 2,376,433. Arlie Julien and George Terziev to The Solvay Process Co.

Manufacture of sodium hydrosulphides. No. 2,376,434. Charles Koenig to The Solvay Process Co.

Producing sodium hydrosulphide which comprises forming aqueous Na_2CO_3 solution, contacting said solution with gas containing H_2S and CO_2. No. 2,376,435. Arthur Saddington to The Solvay Process Co.

Forming luminescent screen comprising dispersing a luminescent material in aqueous solution of lithium hydroxide, etc. No. 2,376,437. Humboldt Leverenz to Radio Corp. of America.

Glucosides and process of making the same. No. 2,376,443. Karl Miescher and Jules Heer and Werner Fischer to Ciba Pharmaceutical Products Inc.

Stabilized product comprising nitrourea and solid compound taken from acids and acid salts. No. 2,376,474. Lawton Burrows, Walter Holmes, and Charles Spaeth to E. I. du Pont de Nemours & Co.

Granular bouillon. No. 2,376,485. Siegwart Hermann and Marianne Hahn and Herbert Dorer to Verona Chemical Co.

Granular bouillon. No. 2,376,486. Siegwart Hermann and Marianne Hahn and Herbert Dorer to Verona Chemical Co.

Aqueous bituminous emulsion comprising bituminous material as dispersed phase, water as continuous phase, and emulsifying agent comprising saponification product of a water-soluble alkali and a wood digestion resin. No. 2,376,498. Robert Martin to Hercules Powder Co.

Ester gum of low acid number and high softening point comprising reaction product of abietic acid and polyallyl alcohol containing at least 5 reactive hydroxyl groups. No. 2,376,504. Harry Pfann and Edward Kropa to American Cyanamid Co.

Treating oilseeds with morpholine to raise pH to not less than 8, storing for one week, and extracting oil therefrom, whereby oil is lightened in color. No. 2,376,568. Aaron Altschul and Melvin Karon to the Secretary of Agriculture of the United States of America.

Additional patents on all other classifications from the above volumes will be given next month.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those interested in obtaining further information concerning the patents reported below should communicate with the Patent Department, CHEMICAL INDUSTRIES. Photostated copies of Canadian patents are available from the Commissioner of Patents, Ottawa, Canada.

CANADIAN PATENTS

Granted and Published March 27, 1945 (Continued)

Process comprising reacting methyl-3-methoxy-cinchomeronic acid with mixture of methyl alcohol and mineral acid. No. 426,392. Merck & Co. (Eric T. Stiller)

Member selected from the group consisting of a dialkyl ester of 2-methyl-2-alkoxy-pyridine-4,5,-dicarboxylic acid and a hydrohalide salt thereof. No. 426,393. Merck & Co. (Eric T. Stiller)

Reclaiming vulcanized rubber waste by grinding, mixing the same with abietic acid, cyvlic acid, coumarone, copal, or such, and recating between 100° and 140° Cent. No. 426,401. Rubber and Plastics Compound Co. (Sudamericana de Patentes S. A., Angiolo Treves)

Reduced pressure distillation method for purification of glycerin manufactured synthetically from hydrocarbons or by hydrolysis of halohydrins. No. 426,406. Shell Development Co. (James R. Scheibli, Greald H. van de Griendt)

Oxidation resistant cable oil consisting essentially or tertiary alkyl naphthalenes free from primary and secondary alkyl radicals, having viscosity index below —100, b. p. above 190° Cent. at 3 mm. of Hg, and dielectric strength above 35 K. V. No. 426,407. Shell Development Company (Robert G. Larsen)

Process for the treatment of rubber waste by grinding with abietic acid, coumarone, copal or such, reacting between 140° and 180° Cent., and thus obtaining uniform rubber composition soluble in crude rubber solvents. No. 426,411. Sudamericana de Patentes S. A. (Angiolo Treves)

Optical objective for profile projection. No. 426,412. Taylor, Taylor & Hobson Ltd. (Gorrie Wynne)

Compartment type pulp beater design. No. 426,443. Roy A. Nash, M. N. Jones, M. D. Nash, Marie D. Nash.

Dim out material composed of cellulose acetate fabric of dark colour, pigmented, with interstices comprising at least 40 per cent of area of fabric. No. 426,450. Camille Dreyfus (Henry C. Van Brederode)

Granted and Published April 3, 1945

Production of water-insoluble resin, having cationic and colour absorption properties by admixture of alginic material and sulphuric acid and heating to 150° Cent. No. 426,457. Robert Boyd.

Method of manufacturing diamond tools by charging hard metal particles with diamond particles, by ball milling, and pressure molding. No. 426,466. Frederick Charles Jearum.

Coffee treatment embodying freezing green coffee, moistening the berries with steam, and treating with ultra violet for more than two minutes. No. 426,467. Daniel Joseph Kennedy.

Spark plug design comprising metal casing, aluminum oxide tip, thermoplastic insulation, and molybdenum portion of electrode adjacent to ceramic and thermoplastic portions. No. 426,470. Paul R. Mena.

Apparatus for sterilizing surgical gloves in continuous fashion. No. 426,474. Gordon E. Richards.

Furnace design for continuous treatment of oil-containing magnesium scrap, for the recovery of deoiled magnesium and oil. No. 426,475. Max Stern.

Coffee substitute composed of starchy flour 6 parts; yeast, 2 parts; malt, 1.2 parts; soybean flour, 0.8 parts; and water sufficient to make a dough-like mass capable of being shredded, dried, roasted, and ground. No. 426,479. Bert West.

Method of manufacturing, continuously, two-compartment, liquid filled, soft gelatine capsules, and machine improvements thereof. No. 426,481. Abbott Laboratories (Edward A. Ravenscroft, Robt. E. Jordan)

Manufacture of paper of increased water resistance and wet strength, comprising addition of rosin size and alum to paper making fibres, felting to form sheet, and applying thereto 0.5 to 5.0 per cent by weight of melamine-formaldehyde and polymerizing such condensation product. No. 426,485. American Cyanamid Co. (Chester G. Landes, Chas. S. Maxwell)

Protein plastic capable of being hot-moulded, prepared by reaction of protein, obtained from soya bean, casein, etc., and resinous reaction product of boric acid and glycerol or ethylene glycol. No. 426,500. Canadian Industries Ltd. (John Prongle Dickson)

Aqueous dispersion of a polymer of ethylene, and method of manufacture, which by X ray diffraction analysis appears to be of crystalline nature. No. 426,501. Canadian Industries Ltd. (Alfonso Miguel Alvarado, Geo. Lowrance Dorough)

Product of interpolymerization of 20 parts of N-methylmethacrylamide with 80 parts of methyl methacrylate. No. 426,502. Canadian Industries Ltd. (Ralph Albert Jacobsen, Chas. Joseph Mighton)

Process for the manufacture of polymerized alpha-haloacrylic acid ester compositions. No. 426,503. Canadian Industries Ltd. (Thomas Sefton Ireland)

Manufacture of a polyvinyl ketal by reacting polyvinyl alcohol with a monomeric ketal of a ketone, in an anhydrous solvent, in presence of a condensation catalyst. No. 426,504. Canadian Industries Ltd. (Courtland L. Agre, Geo. L. Dorough, Wm. E. Hanford)

Manufacture of lactic acid modified polyglycolide resin by reaction of 300 parts of glycolic acid; 233 parts of water; 117 parts of 85 per cent lactic acid; rapidly, at 200° Cent., holding at temperature for two hours, and continuing heating for additional one-half hour under vacuum. No. 426,505. Canadian Industries Ltd. (Wilber Otis Teeters)

Heat and light stabilized halogenated ethylene polymer in which is incorporated as stabilizing agent, oxygen-containing compounds consisting of salicylic acid, and ester of aromatic acids with monohydric, dihydric, and trihydric, phenols. No. 426,506. Canadian Industries Ltd. (Donald Whittaker)

Manufacture of quaternary ammonium salts, useful for imparting permanent water-repellency to textiles, by reacting pyridine with reaction product of hydrohen chloride and paraformaldehyde with methylol octadecyl carbamate. No. 426,507. Canadian Industries Ltd. (Alfred Wm. Baldwin, Donald Hey, M. A. T. Rogers)

Preparation of modified oils and resins comprising refluxing fatty unsaturated, non-hydroxylated oils containing substnatially no conjugation and maleic acid esters of unsaturated alcohols (e. g. diallyl maleate.) No. 426,508. Canadian Industries Ltd. (Ben Edmund Sorenson)

Resinous interpolymer of styrene, and resin obtained by reacting diester of maleic acid and allyl or methallyl alcohol, and a fatty oil having drying properties and a degree of conjugation not greater than that of dehydrated castor oil. No. 426,509. Canadian Industries Ltd. (Ben. E. Sorenson)

Substantive textile finishing composition, comprising stable aqueous dispersion of polymerized butyl methacrylate containing as the dispersing agent a partially saponified polyvinyl acetate, plus a water soluble aluminum salt to render material substantive. No. 426,511. Canadian Industries Ltd. (Joseph Edward Smith)

Denture molding compound comprising methyl methacrylate monomer, methyl methacrylate polymer, and 1.5 to 7.5 per cent paraffin wax. No. 426,515. Canadian Industries Ltd. (Glen M. Kuettel)

Interpolymer containing 25-80 per cent vinyl acetate interpolymerized at 50-150 Cent. with the pre-formed, organic solvent soluble product of the reaction, by heating of a frosting China wood oil composition with minor proportion of methyl methacrylate. No. 426,516. Canadian Industries Ltd. (Chas. J. Mighton)

Mixture for protecting seeds against pests, containing sulphur nitride, and substance of the group consisting of dibutyl hydrogen phosphate, mono-amyl hydrogen phosphate, diphenyl hydrogen phosphate, and mono-cresyl hydrogen phosphate. No. 426,517. Canadian Industries Ltd. (Michael H. M. Arnold)

Process for catalytic preparation of ethylene glycol by vapour phase hydrogenation of isobutyl hydroxy acetate. No. 426,518. Canadian Industries Ltd. (Fred Ward Pardee, Jr.)

Flock-coated die for forming thermoplastic sheets. No. 426,519. Canadian Industries Ltd. (Richard Edward Leary)

Improved electrolytic process for continuous production of iron and ferric sulfate solution from acidulated aqueous solution of ferrous sulfate. No. 426,521. Canadian National Carbon Co. Ltd. (Erwin A. Schumacher, George W. Heise)

Stable, storage-resistant, and water-resistant adhesive composition, of dispersed rubber, and rosin, copal, manila or senegal, and casein. No. 426,532. Dewey and Almy Chemical Co. of Canada Ltd. (J. G. Mark)

Asbestos fabric, containing appreciable quantity of inflammable fibres, rendered flame and water resistant by deposition of inorganic oxide upon the fabric, bonded by fused, water-repellent metal soap, such fabric capable of being dry-cleaned without affecting water-repellent property. No. 426,534. Dominion Rubber Co. Ltd. (John Louis Kurlychek)

Process of producing water soluble derivatives of beta-methyl-alpha-napthoquinone having vitamin K activity which includes forming the alkali metal bisulphite adducts thereof. No. 426,555. The Wm. S. Merrell Co. (Robt. S. Shelton, Marcus G. Van Campen, Jr.)

Zirconium oxide refractory, composed of zirconium oxide, 0.002 to 0.5 per cent of a water dispersible colloid and like quantity of a monohydroxyl base. No. 426,574. The Titanium Alloy Manufacturing Co. (Eugene Wainer)

Sweat-band for a hat composed of inner layer of fabric coated on one side only with cellulose acetate joined to outer fabric envelope coated with water-repellent emulsion of an aluminum salt and wax. No. 426,602. Camille Dreyfus (Louis Glass)

Granted and Published April 10, 1945

Lubricant composed of lubricating mineral oil containing paraffin wax and 2 to 10 per cent para-cymene to lower the pour point of the oil. No. 426,616. Thomas J. Brown.

Process for treating nuts to soften shells thereof employing treatment with anhydrous aluminum chloride, ferric chloride, antimony pentachloride, sulphur monochloride, thionyl chloride, phosphorus trichloride or phosphorus pentachloride, for 12 to 60 hours. No. 426,629. Charles H. Frazier.

Method of treating aluminum surface for use as printing surface employing alkali metal fluoride and acid wash. No. 426,641. Ralph Bryant Mason.

Pile fabric cleaning compound composed of 100 to 325 mesh bentonite and 3 to 7 gallons of organic grease solvent per 100 pounds of the clay. No. 426,667. Bigelow-Sandford Carpet Co. Inc. (Giles Eiberne Hopkins)

(*To be continued*)

Trademarks of the Month

A Checklist of Chemical and Chemical Specialties Trademarks

414,071. The Pure Oil Co., Chicago, Ill.; filed Jan. 17, 1944; Serial No. 466,657; for flushing oil; since July 16, 1943.

414,085. Tennessee Copper Co., Copperhill, Tenn.; filed Oct. 23, 1944; Serial No. 475,637; for copper fungicides; since Aug. 20, 1937.

414,092. The Gregg Co., Philadelphia, Pa.; filed Jan. 17, 1945; Serial No. 478,709; for manufacturing coatings; since Jan. 25, 1940.

414,245. Diamond Alkali Co., Pittsburgh, Pa.; filed Oct. 8, 1943; Serial No. 463,993; for meta, ortho, supersilicate, etc.; since May 1931.

414,253. Spencer-Adams Paint Co., Inc., Atlanta, Ga.; filed Apr. 27, 1944; Serial No. 469,738; for paint, varnish, and stains; since Apr. 6, 1944.

414,367. Pontiac Varnish Co., Pontiac, Mich.; filed Mar. 9, 1944; Serial No. 468,124; for jell applied to metal to form protective covering; since Nov. 13, 1943.

414,376. Lloyd Jay Bohannon, Kansas City, Mo.; filed Apr. 26, 1944; Serial No. 469,666; for paint; since Apr. 22, 1944.

414,398. Warner Electric Co., Chicago, Ill.; filed Dec. 15, 1944; Serial No. 477,635; for electroplating compound; since Jan. 1, 1938.

465,094. United States Quarry Tile Co., Canton, East Sparta, Ohio, Parkersburg, W. Va.; filed Nov. 17, 1943; for paints used in radar equipment; since Dec. 22, 1942.

465,518. Winkels & Fischer, Whitestone, N. Y.; filed Dec. 4, 1943; to improve durability of leather; since Nov. 12, 1943.

466,831. Diamond Springs Lime Co., Diamond Springs, Calif.; filed Jan. 24, 1944; for powder of calcium hydroxide, mixture proteoses, peptones, amino acids; since Feb. 12, 1943.

470,044. Louis William Schatz, as General Plastics Mfg. Co., South Tacoma, Wash.; filed May 8, 1944; for impregnating fibrous products; since Mar. 6, 1944.

472,090. Vita-Var Corp., Newark, N. J.; filed July 10, 1944; for synthetic resins; since May 15, 1944.

473,660. The Dolanize Co., N. Y.; filed Aug. 28, 1944; for water repellent; since Jan. 30, 1943.

474,503. Oronite Chemical Co., Wilmington, Del., San Francisco, Calif.; filed Sept. 22. 1944; for waterproofing compounds; since Oct. 13, 1943.

474,562. Vita-Var Corp., Newark, N. J.; filed Sept. 23, 1944; for paint; since Aug. 10, 1944.

475,466. Refined Products Co., Lyndhurst, N. J.; filed Oct. 18, 1944; for softening and finishing agent; since Feb. 1, 1940.

476,980. The Nugget Polish Co. of New York Ltd., London, England; filed Nov. 28, 1944; for leather, metal polishes; since Apr. 23, 1932.

477,939. Howard J. McAleer, as Formax Mfg. Co., Detroit, Mich.; filed Dec. 26, 1944; for degreasing compounds; sincve June 27, 1944.

478,038. Diamond Alkali Co., Pittsburgh, Pa.; filed Dec. 29, 1944; for laundry detergent; since September 1943.

478,193. Titanine, Inc., Union, N. J.; filed Jan. 3, 1945; for paints; since Dec. 20, 1944.

478,300. Bert Unger, as Cello-Plastic Chemical Co., Pittsburgh, Pa.; filed Jan. 5, 1945; for paints; since Oct. 3, 1942.

478,686. Mer-O-Ree, Inc., Bethesda, Md.; filed Jan. 16, 1945; for fungicide for paint; since Jan. 2, 1945.

478,722. Red Spot Paint & Varnish Co. Inc., Evansville, Ind.; filed Jan. 17, 1945; for quick drying plastic; since Mar. 15, 1944.

478,779. Wisconsin Chemical Products Co., Milwaukee, Wis.; filed Jan. 18, 1945; for leather preparations; since March 1938.

478,780. The British Drug Houses, Ltd. and Hopkin & Williams, Ltd., London, England; filed Jan. 19, 1945; for analytical reagents; since October 1934.

478,930. Potash Co. of America, Atlanta, Ga., N. Y., Carlsbad, N. Mex.; filed Jan. 23, 1945; for potash; since Oct. 15, 1937.

478,980. Sylvania Industrial Corp., Fredericksburg, Va., and N. Y.; filed Jan. 24, 1945; for impregnating and coating yarns and papers; since May 6, 1942.

479,050. Rocket Products Co., St. Louis, Mo.; filed Jan. 26, 1945; for insecticides; since Dec. 15, 1943.

479,098. Stauffer Chemical Co., San Francisco, Calif.; filed Jan. 27, 1945; for insecticides and fungicides; since Sept. 11, 1944.

479,109. Central Chemical Corp. of Md., Hagerstown, Md.; filed Jan. 29, 1945; for insecticides for spraying; since Feb. 21, 1944.

479,118. E. A. Gerlach Co., Philadelphia, Pa.; filed Jan. 29, 1945; for degreasing engine parts; since Mar. 4, 1943.

479,513, 479,564. The Firestone Tire & Rubber Co., as Firestone Aircraft Co., Akron, Ohio; filed Feb. 7, 1945; for structural reinforcing resin; since Oct. 26, 1942; filed Feb. 8, 1945; since Oct. 20, 1943.

479,667. The Firestone Tire & Rubber Co., Akron, Ohio; filed Feb. 10, 1945; for rubber latices; since Aug. 8, 1944.

479,711. Philip T. Gidley, Fairhaven, Mass.; filed Feb. 12, 1945; for promoting storage stability of flastomer; since Nov. 3, 1943.

479,757. Spebra Products Mfg. Co., Inc., Brooklyn, N. Y.; filed Feb. 13, 1945; for disinfectant for food industries; since Jan. 2, 1945.

479,891. Monsanto Chemical Co., St. Louis, Mo.; filed Feb. 16, 1945; for vulcanization accelerators; since Feb. 6, 1945.

479,892. Monsanto Chemical Co., St. Louis, Mo.; filed Feb. 16, 1945; for preservation of rubber; since Oct. 17, 1944.

479,955. Swift & Co., Chicago, Ill.; filed Feb. 17, 1945; for chemical fertilizer; since Aug. 22, 1944.

479,987. Leo J. Rampel, as Rampel Chemical Co., Mount Vernon, N. Y.; filed Feb. 19, 1945; for water-repellent chemical composition since June 1941.

479,988. Leo J. Rampel, as Rampel Chemical Co., Mount Vernon, N. Y.; filed Feb. 19, 1945; for anti-mildew agent; since June 1941.

480,093. Standard Oil Co. of New Jersey, Wilmington, Del.; filed Feb. 21, 1945; for lubricating oils; since Nov. 22, 1944.

480,167. Diamond Alkali Co., Pittsburgh, Pa.; filed Feb. 24, 1945; for laundry sour; since June 3, 1940.

480,168. Diamond Alkali Co., Pittsburgh, Pa.; filed Feb. 24, 1945; for laundry sour; since June 3, 1940.

480,479. Wm. T. Thompson, as Wm. T. Thompson Co., Los Angeles, Calif.; filed Mar. 3, 1945; for dichlorophenoxyacetic acid for destroying weeds; since Jan. 26, 1945.

480,700. Givaudan-Delawanna, Inc., N. Y.; filed Mar. 9, 1945; for hydrogenated lanolin; since Feb. 24, 1945.

480,904. Robert H. Harkins, as Nott Mfg. Co., Mount Vernon, N. Y.; filed Mar. 14, 1945; for killing insects; since Jan. 19, 1938.

481,026. Clara E. Quinn, St. Petersburg, Fla.; filed Mar. 17, 1945; for fluid refrigerant; since Mar. 1, 1945.

Trademarks reproduced and described include those appearing in Official Gazette of U. S. Patent Office, May 15 to June 5.

GENERAL CHEMICAL ALKALI FLUOBORATES

Chemicals of Progress for the LIGHT METAL INDUSTRY

Ammonium Fluoborate NH_4BF_4

Melting Point: 230° C (446° F) compound sublimes. At pouring temperatures, rapid sublimination.

Solubility in water:

Temp. °C	%NH_4BF_4 by weight
16	20.0
40	26.5
55	33.2
70	38.7
100	46.5

pH of 1% aqueous solution: 3.4 at 25° C (77° F)

Potassium Fluoborate KBF_4

Melting Point: 529.5° C (985° F) compound essentially stable. At pouring temperatures, slow decomposition.

Solubility in water:

Temp. °C	%KBF_4 by weight
25.	.55
34.7	.94
54.5	1.98
78.0	4.58
100.0	8.5

pH of saturated aqueous solution: 3.0 at 25° C (77° F)

Sodium Fluoborate $NaBF_4$

Melting Point: 384° C (723.2° F) slight decomposition. At pouring temperature, slow decomposition.

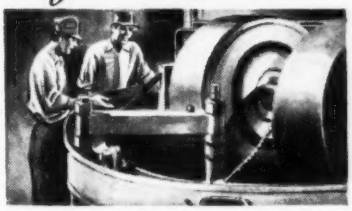
Solubility in water:

Temp. °C	% $NaBF_4$ by weight
26.5	52.1
40.0	55.3
78.0	64.4
100.0	68.6

pH of 1% aqueous solution: 3.0

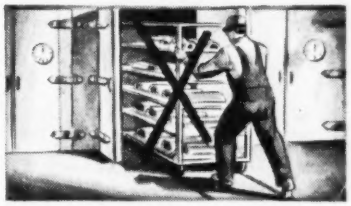
FIRST IN FLUORIDES . . .

General Chemical leadership in the field of fluorides embraces a wide range of fluorine compounds. Our long experience and "know how" may prove as invaluable to you in your operations as they have to many other users of such products. For helpful technical service and full information on the Alkali Fluoborates, contact the General Chemical Sales and Technical Service Office nearest you or write General Chemical Company, Fluorine Division, 40 Rector Street, New York 6, N. Y.



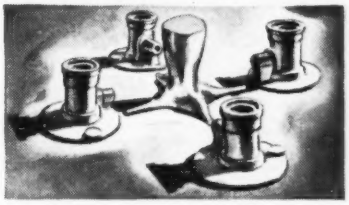
SUPERIOR INHIBITORS

Do not lose inhibiting action during baking; no excessive gassing. Give greater core strength.



SECOND BAKING UNNECESSARY

Eliminate spraying, second baking operation, and duplicate handling. Save time, labor, and step up oven output.



BETTER CASTINGS

. . finer grain, cleaner fracture, higher tensile strength and elongation obtained.

BASIC CHEMICALS

GENERAL CHEMICAL COMPANY

FOR AMERICAN INDUSTRY

The special properties of General Chemical Alkali Fluoborates as oxidation inhibitors—plus their high effectiveness in production of finer grain metals—make them ideally suited to the exacting fabrication requirements of the Light Metal Industry.

SUPERIOR INHIBITORS

General's Potassium and Ammonium Fluoborates, for example, have been found superior to many other inhibitors mixed in core sands. Due to their higher melting points and slower rates of decomposition, they do not lose inhibiting action during baking nor do they produce excessive gassing during pouring. In addition, they can be used with the cheaper, higher baking core oils!

With these chemicals of progress, greater core strength is obtainable too . . . spraying and second baking operations are unnecessary . . . and objectionable fumes may be reduced or eliminated.

BETTER CASTINGS

Manufacturing experience has demonstrated that when these Alkali Fluoborates are used as sand treating agents, there is often marked improvement in the physical properties of the metal . . . melting pot additions of Potassium Fluoborate produce aluminum castings in which finer grain, cleaner fracture, higher tensile strength and increased elongation are obtained.

GENERAL CHEMICAL COMPANY

40 Rector Street, New York 6, N. Y.

Sales and Technical Service Offices: Atlanta • Baltimore Boston • Bridgeport (Conn.) • Buffalo • Charlotte (N. C.) Chicago • Cleveland • Denver • Detroit • Houston Kansas City • Los Angeles • Minneapolis • New York Philadelphia • Pittsburgh • Providence (R. I.) • San Francisco • Seattle • St. Louis • Utica (N. Y.) Wenatchee (Wash.) • Yakima (Wash.)

In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wisconsin

In Canada: The Nichols Chemical Company, Limited Montreal • Toronto • Vancouver

"It's Tough Going till you hit the Asphalt"

By 1920 the automobile had come to stay—but its wheels were stuck in horse-and-buggy roads. Cross-country motoring was still an adventure, often a constant struggle with mud, dust, ruts and slippery hills. Everywhere the question was, "How are the roads?" The joy of every traveler was to strike a long, smooth stretch of asphalt. Yet in 1920 there were only about a hundred thousand miles of asphalt paved roads and streets in the entire country, most of them in cities and towns. Today there are nearly half a million miles—enough to reach eighteen times around the world—and future plans call for vast new asphalt construction.

"Hitting the asphalt" is now an air age expression. The same qualities that make it the preferred material for many types of roads—durability, adaptability, resilience, impact resistance—also make it preferred for airport runways. As a result, it is a standard surfacing, not only for base fields throughout the world, but for many advance fighter fields in the form of impregnated cloth strips which can be laid quickly and easily. It is, in fact, a foundation on which our expanding air power is built.

Founded in 1920, Witco has helped to make asphalt the versatile, adaptable material it is today. Through the expansion and improvement of the famous Pioneer line, known since the turn of the century, Witco now produces scores of asphalt specialties for hundreds of purposes—water-proofing, paint products, roofing, oil pipe line coating and joint sealing compounds, barrel linings, plastic cements, irrigation projects, insulating for refrigeration, revetment work and other uses. With two asphalt plants and a modern research laboratory, Witco is prepared to meet the increasing demand for asphalts and asphalt derivatives with specifically engineered properties. This is part of Witco's expanding service in chemicals, oils, pigments and allied products.

WITCO CHEMICAL COMPANY MANUFACTURERS AND EXPORTERS

[FORMERLY WISHNICK-TUMPEER, INC.]

295 MADISON AVENUE, NEW YORK 17, N. Y. • BOSTON • CHICAGO • DETROIT • AKRON • CLEVELAND • LONDON